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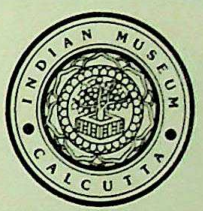

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EDITORIAL NOTE

The 22nd issue of the Indian Museum Bulletin is being handed over to the readers in the 175th anniversary of the Institution. We have a backlog of about two years and efforts are on to make the Bulletin up-to-date.

The present issue is of much significance for the fact that several new epigraphic discoveries have been discussed and for this the papers of Prof. B. N. Mukherjee and Dr. I. K. Sarma and his colleagues deserve special mention. Beside art, numismatics and geology, museological side has been analysed in three articles. The column of book review also recommences from this number.

For the convenience of the readers and researchers the print script used this time is bolder.

While expressing sincere gratitude to the contributors and readers we appeal to them to try and suggest the ways and means for wider circulation of the Bulletin which is heavily subsidised.

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ROCK EDICTS OF AŚOKA FROM SANNATI, CHITAPUR TALUK, GULBARGA DISTRICT (KARṆĀṬAKA)

I. K. SARMA, R. V. SIVA SARMA AND J. VARAPRASADA RAO

SANNATI (Lat°57′ E; Long.76°54′ N) in Chitapur Taluk of Gulbarga District was recognised as a Buddhist site ever since its first discovery by (late) Kapatral[1] Krishna Rao of Gulbarga in the year 1954. This remote village on the left bank of the river Bhīmā, a tributary of Krishna, is approachable through a rugged road to a distance of 50 Km. north-west of Yadgir. It is about 40 Km. from Chitapur-Nalwar R. S. on the Wadi-Secunderabad line. The village is famous as a pilgrim centre on account of the temple dedicated to Chandralāṁbā. The goddess is also named as *Chaṇḍāla Parameśvari*, apparently a *Śāktaīc* deity. According to a *sthala purāṇa*, Rāma and Sīta were born as sage Nārāyaṇa and Chandravadana who later became Chandrāṁbā. A king named Setu[2] tried to molest Sīta but perished by her curse. It is curious to note that the fortified area in Sannati is locally called *Seturājanakaṭṭe* mistakenly regarded by K. V. Ramesh as the corruption of an ancient appellation for *Sātavāhana koṭe* meaning the fort of the *Sātavāhanas*[3].

Explorations were carried out by the Department of Archaeology, Mysore State in the year 1964-65 under (late) M. Seshadri who published an account[4] on the site. Subsequently, P. B. Desai of Karnatak University, Dharwar, conducted further explorations in February—1968[5] and noted the place as "the biggest Buddhist Centre in Karṇāṭaka".

Apart from the extensive fortifications along the left bank of river Bhīmā, starting from Sannati at one end to the village Kanaganahalli on the other, the place has been archaeologically very potential with atleast two big mounds nearly two km. away from the fortified area. These mounds were generally regarded as *Stūpas*. The one nearer to the river zone is spoiled to the ground with a lot of sculptured and inscribed members of lime stone[6], while the other, somewhat nearer to the temple area is being excavated by the Archaeological Survey of India in collaboration with James Howell, Research Fellow, Society for South Asian Studies from the year 1986-87 onwards. A. Sundara[7], former Director, Department of Archaeology and Museums, Government of Karnataka, conducted a small scale probe between December, 1986 to May, 1987 closer to the fortified site. This fortified area is about 80 hectares in extent with brick fortification walls approximately four meter wide, 3 meter high and is divided into two parts[8].

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I. Discovery of the Rock Edicts

Basing on the first hand report communicated by G. V. S. Rao, Deputy Superintending Archaeologist, Hyderabad Circle on 2nd February, 1989 and after a telephonic confirmation from A. P. Sagar, Superintending Archaeologist, Hyderabad Circle, I have availed the earliest opportunity to visit the site accompanied by them. An eye copy of the inscription prepared by R. V. Siva Sarma, Assistant Superintending Archaeologist and J. Varaprasada Rao, Technical Assistant of the Hyderabad Circle was made available to me at Hyderabad on 5.2.1989. The above two officials have recognised the records as of Aśoka on 20.1.89 itself though the completeness and the form of certain letters, the reading thereupon, were not fully attested due to lack of reference books at the excavation camp. It may be recalled that last year during a surface exploration in the *Raṇamaṇḍala* site within the fortified area, A. P. Sagar, Superintending Archaeologist discovered (12.1.1988) a granite stone bearing Mauryan polish and registered as an antiquity (*vide* No. 367 SAN-2 dated 14.1.1988). No attempt has, however, been made to excavate within fortified area although an early phase of occupation as that of *circa* third-second century B.C. date was anticipated. The size of bricks ($54 \times 27 \times 9$ cm., $47 \times 24 \times 8$ cms.) noted within the fortified area and around also confirmed this hypothesis. It is, therefore, not very surprising that an inscription of the Mauryan times was discovered now.

It appears that the Temple Committee has decided to renovate the Devī shrine on the left of the main temple which was partly in ruins. Since the old image of Mahākāḷi here was broken into bits, a proposal for reconsecrating the shrine with a new image was under active consideration. As such, the temple authorities initiated the removal of loose stones, overhanging pillars and fallen beams (Pl. 1). These were mostly of granite and lime stones. In this clearance work the pedestal stone laid on the shrine floor was cleared along with its *nālika*. During this time, R. V. Siva Sarma and J. Varaprasada Rao who were present at the site partly noticed the inscription on the pedestal and prepared an eye copy. S. R. Rao, the noted Archaeologist, a devotee of Goddess Chandralāmbā happened to visit the temple on 29.1.89, saw the inscribed stone and reported to the Press at Bangalore. "The characters in 10-line inscription on a slab resembled either Aśokan Brāhmī or slightly later but undoubtedly of pre-Chālukyan period"[9]. However, the two technical officers of Hyderabad Circle have already noticed 12-lines in all and made an eye copy. The concluding part was clearly read by them as "*Iyaṁ Dhamma lipi Devānāṁ Piyena*". Hence, there is no doubt that the credit of discovery of this Asokan record squarely goes to R. V. Siva Sarma, Assistant Superintending Archaeologist and J. Varaprasada Rao, Technical Assistance of Hyderabad Circle, who are co-authors of this paper. Later, the office of the Epigraphy Branch, Mysore deputed its Epigraphical Assistant for obtaining estampages of the records (3.2.1989).

II. Devī Shrine (Pl. 1)

The temple on plan has a square *garbhagriha*, an *antharāla* leading to a *mahā maṇḍapa* on a row of pillars with the central *ankaṇa* demarcated by four ornate pillars. The periphery has *kakshāsana* platform the top course of it missing. The pillars are of later Kalyāṇi Chālukyan type. The sanctum, which is a square, is preserved only by its *padma jagatī*. Its mouldings partly reveal the nature of the upper elevational members including the *adhiṣṭhāna* part. It appears that *koshṭha* arrangement exists at the three cardinal points of the temple wall. Since the *jagatī* part only is extant and the rest has fallen down, we cannot visualise the shape of the *śikhara*. The Temple Committee is

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now engaged in rebuilding it after totally dismantling these members. The broken image of Chāmuṇḍa on stylistic grounds can be assigned to the Nolamba period, *circa* 8th-9th century A.D. The massive figure is that of a seated Devī (Pl. 2*a*, 2*b*) four handed—right one broken, while the left upper holds a *triśūla* with a demon's head on top, the lower hand carries a bowl in the palm rests on the thigh. The garland of skulls and *nāga kēyuras* (serpentine armlets), emphasize her *śaktīc* nature.

III. **The Inscribed Piṭha Slab** (Pl. 3)

This big slab of brown granite was perhaps severed from its original rock boulder whose locus remains to be ascertained. This massive stone is a flattish rectangular piece, measuring 2·33 × 1·21 meters and 30 cm. in thickness. The rough cut markings at one end clearly show that the slab was quarried without realising the existence of the inscribed record on its face by the builders of the shrine.

The record contains in total 12-lines. The upper eight lines and the lower four are separated by a short horizontal stroke at the left margin indicating thereby two different edicts. At the right extreme border, a similar short incised line on the ridge suggests another edict (perhaps part of 13th Rock Edict). The ridged border and the sizing of the rock to prepare the *nālika* has caused serious damage to the letters of the text. The beginnings and the right extent of the inscribed part are also badly damaged as a result the full text of the existing edicts cannot be made out.

The writing is somewhat indifferent. The lines are not straight, though the letters are quite boldly carved. The rock, after engraving the letters, was subjected to polish, the traces of which can be felt by hand. The letter forms recall those on the Yerragudi Rock Edicts, as also the other Minor Rock Edicts I-II of Nittur and Udegolam, etc.

The extent record, (Pl. 4) though incomplete, as the slab is broken on all the sides, does provide some clues for identification and proper assignment. The text, in 12-lines, is in Brāhmī characters of the Aśokan times, the language is early *Prākrit*. In line-9, the clear mention "*Iyaṁ Dhammalipi Devānāṁ Piyena*" is enough to assign the edict to Aśoka. In the available portions, however, there is no mention of the personal name of Aśoka.

TEXT

1. —.—.—.—.— *pā* —.—.—. *la na* —.—.
2. —.—.—.—. *ā kā* —.—.— *nā he* —.—.—.
3. —.—.—.—. *taṁ aṁta pā sā ḍham cha chha* (——) *pā sa* —.—
4. —.—.—. *śa* (*ga*) *la ha ti sa ve a ta pā sā ḍha* —.—. *u ta ma* —. *ga*
5. —. *a ta pā sā ḍha* (——) *se sa ma vā ye* (*va*) *sa* (*du*) —.—.
6. —.— *sa va pā saṁḍa ba hu* (*suta*) *kiyā nā ga ma* —.—.—. *sa va gi na vata*
7. —. *cha* (*sa*) *gha ti a tha kiti* —.—.—. *ḍha* —.— *ka*
8. —. *ma hā* (——) *va cha rā ji mi ka* —.—.— *ne dhi ni* —.—.

---

9. (*I*) *yaṁ dhaṁ ma li pi de vā naṁ* (*pi*) *ye na* —.—.—. —*va sa*
10. —.— *no hi sa ma ti sa ve gha va* —.—.—.—.
11. —.— *ta sa ta sa* (*a*) (—) *sa ma ta* (*du*) *li ya ye* —.—. (*ye na*) *ja ne ta dha* —
12. —. *yā kā la naṁ va ā lo cha ya tu li pa ka* (*sa*) *pa* (—) *dh* (—) *nu* —.

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In all only two records are extant. They reveal some textual affinities with the XII and XIV versions of the Rock Edicts issued by Aśoka at Girnar, Kalsi and near home at Yerragudi, district Kurnool in Andhra Pradesh. However, a word-to-word comparative study has to be undertaken before the contents of the texts are fully interpreted. However, an attempt is made in Appendix at the end.

The demarcating incised horizontal lines at the two places of the text and the chisel grooves at the terminal end of the record indicate that the other edicts, I to XIII except XII, may have been on the upper top and right sides of the bigger rock boulder, the original locus of it may not be far removed from the chandralāṁbā temple complex. Several granite as well as lime stone carved slabs have been found used within the structure of the temple. Similarly in the fields around quite many ancient spots possess granite boulders and outcrops. Even on the opposite bank of the river Bhīmā, a careful search of these granite outcrops might be very rewarding. A thorough scrutiny is imperative to obtain the remaining parts. It may also be that like the rock edicts at Yerragudi, the texts have been carved on more than one boulder although closer to each other[10].

IV. **Significance of the record**

The above record has brought to light a set of Rock Edicts in Karṇāṭaka for the first time. It is well known that Aśoka caused Minor Rock Edicts along the bordering territories of the Mauryan Empire for the benefit of the peoples living outside his empire. We have a concentration of Minor Rock Edicts in northern Karṇāṭaka at the following places (Fig. 2) Nittur, Udegolam on Tungabhadra river in Siraguppa taluk of Bellary district, Brahmagiri, Siddapur and Jatinga Rameswara of Chitradurga district; Maski, Gavimath and Palkigundu of Raichur district and the present epigraph from Sannati in Gulbarga district is almost at the extreme north of the state touching Āndhra. In South India, it was only at Yerragudi in district Kurnool (Andhra Pradesh) that Aśoka caused the Rock Edicts[11] (I to XIV), by the side of the Minor Rock Edicts. However, "a remarkable difference is noticed between the Minor Rock Edicts on the one hand and the Rock Edicts on the other. This seems to be due to the fact that the two sets of edicts were received at the place separately on different occasions and dates"[12]. Brahmagiri and Siddapur Minor Rock Edicts contain a reference to the presence of Aśoka himself in Suvarṇagiri which appears to be a sub-capital for southern part of Aśokan Empire. Aśoka advises through his *Mahāmātras* to follow up the proclamations made during his tour. At Suvarṇagiri, besides an *Āyaputa*, *Mahāmātras* were stationed. *Āyaputa* is the prince of the Royal family, although this could refer to king himself. H. Krishna Sastry[13] identified Suvarṇagiri with the country around Maski but as D. C. Sircar[14] has pointed out "Suvarnagiri may have stood in the vicinity of Yerragudi". C. R. Krishnamacharyulu[15] long long ago identified this as the present village of Jonnagiri, a Telugu modification of *Prākritic Soṇṇagiri*, i.e., Sanskrit *Suvarṇagiri*.

The Rock Edicts I to XIV at Yerragudi were executed on more than one boulder[16], (A, C, D, E), whereas Minor Rock Edicts I & II were on a single boulder (F) at the lower level of the hillock. There is no doubt that Minor Rock Edicts were caused earlier by the Mauryan king for the outlying areas.

In the light of the versions of Rock Edicts XII and XIV now recovered at Sannati, we may say that at least the Gulbarga area on the river Bhīmā was within the Aśokan

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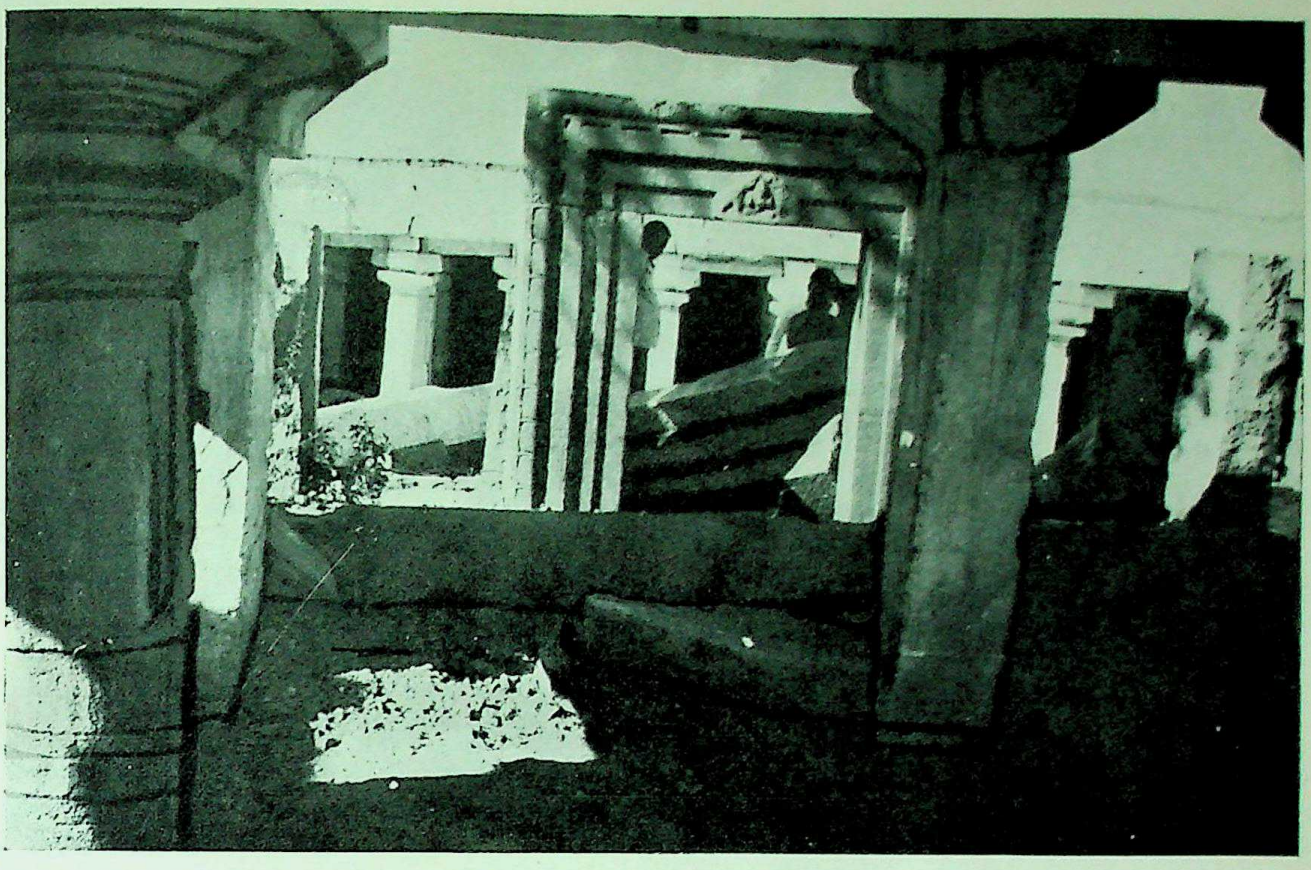

Plate 1. Devī shrine in ruins within Chandralāṁbā temple complex

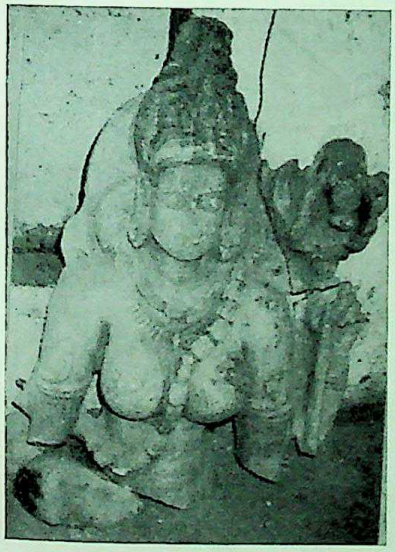

Plate 2a. Devī shrine, 4 handed Kālī image, upper part (Nolamba, 8th-9th cent. A.D.)

Plate 2b.
Kālī image, lower part, the tenon (Nolamba, 8th-9th cent. A.D.)

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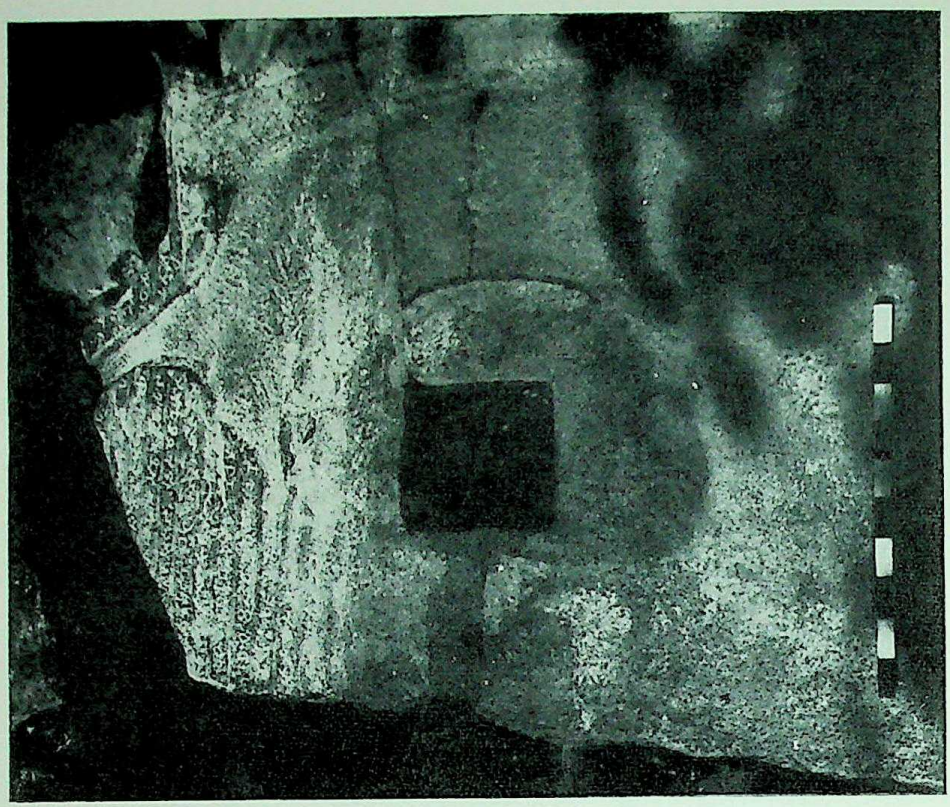

Plate 3. Devī shrine inscribed *Pīṭha* slab of granite with the socket

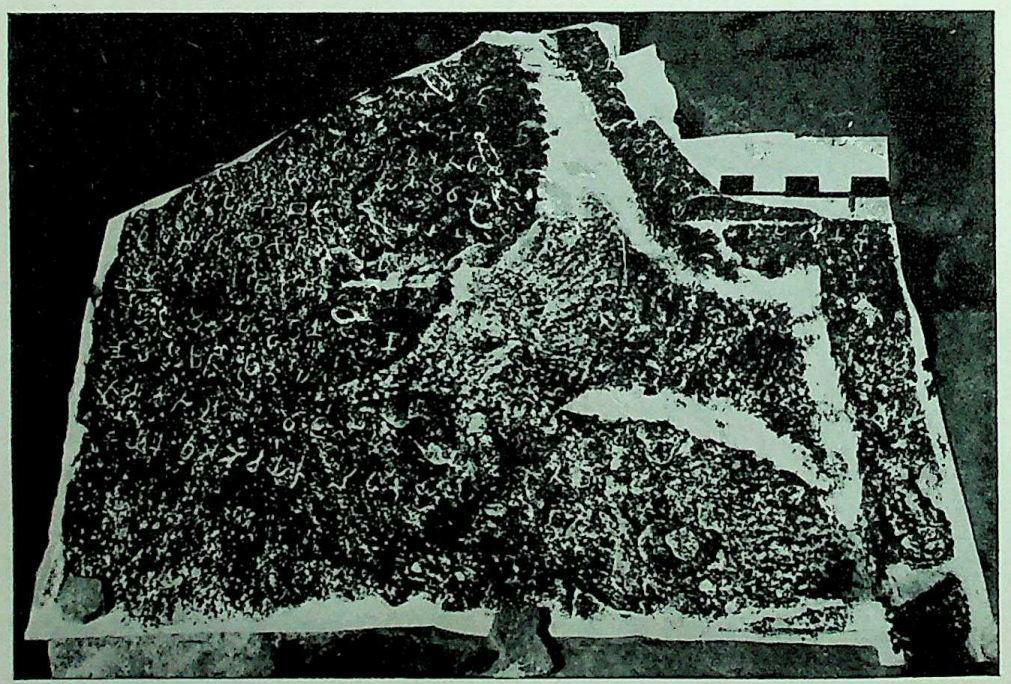

Plate 4. Aśokan Rock Edict on granite *Pīṭha* slab

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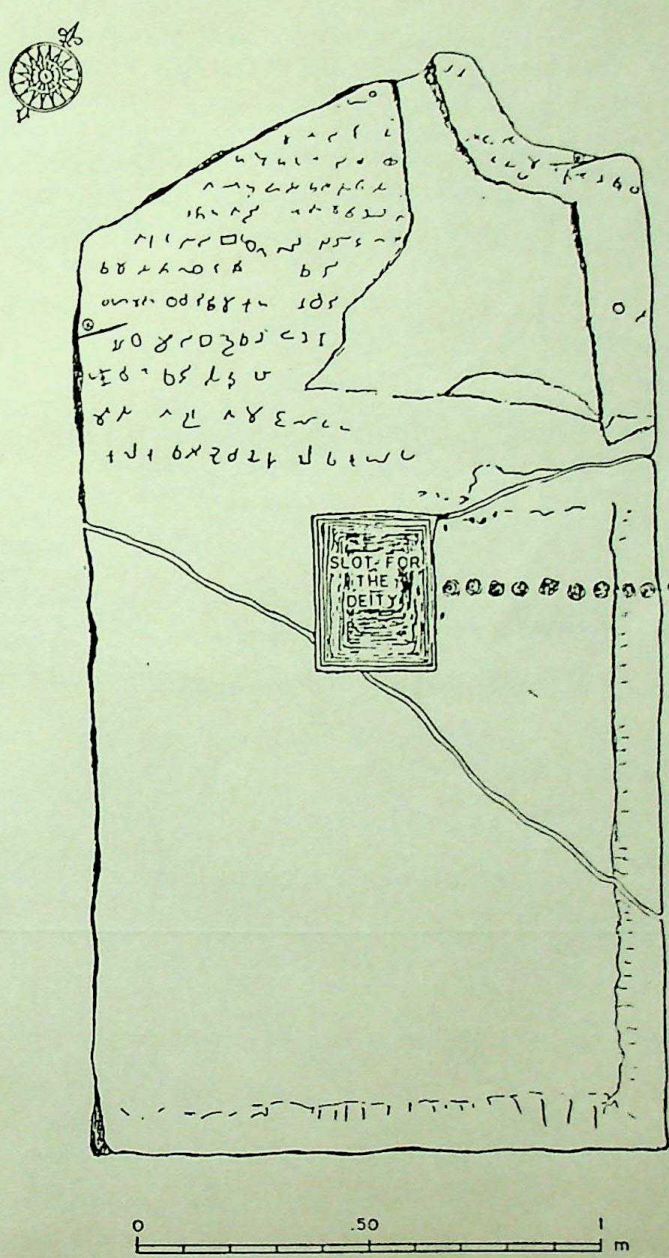
SANNATI, DISTT. GULBARGA (KARNĀTAKA)
CHANDRALĀMBĀ TEMPLE
DEVĪ SHRINE, INSCRIBED PĪTHA SLAB



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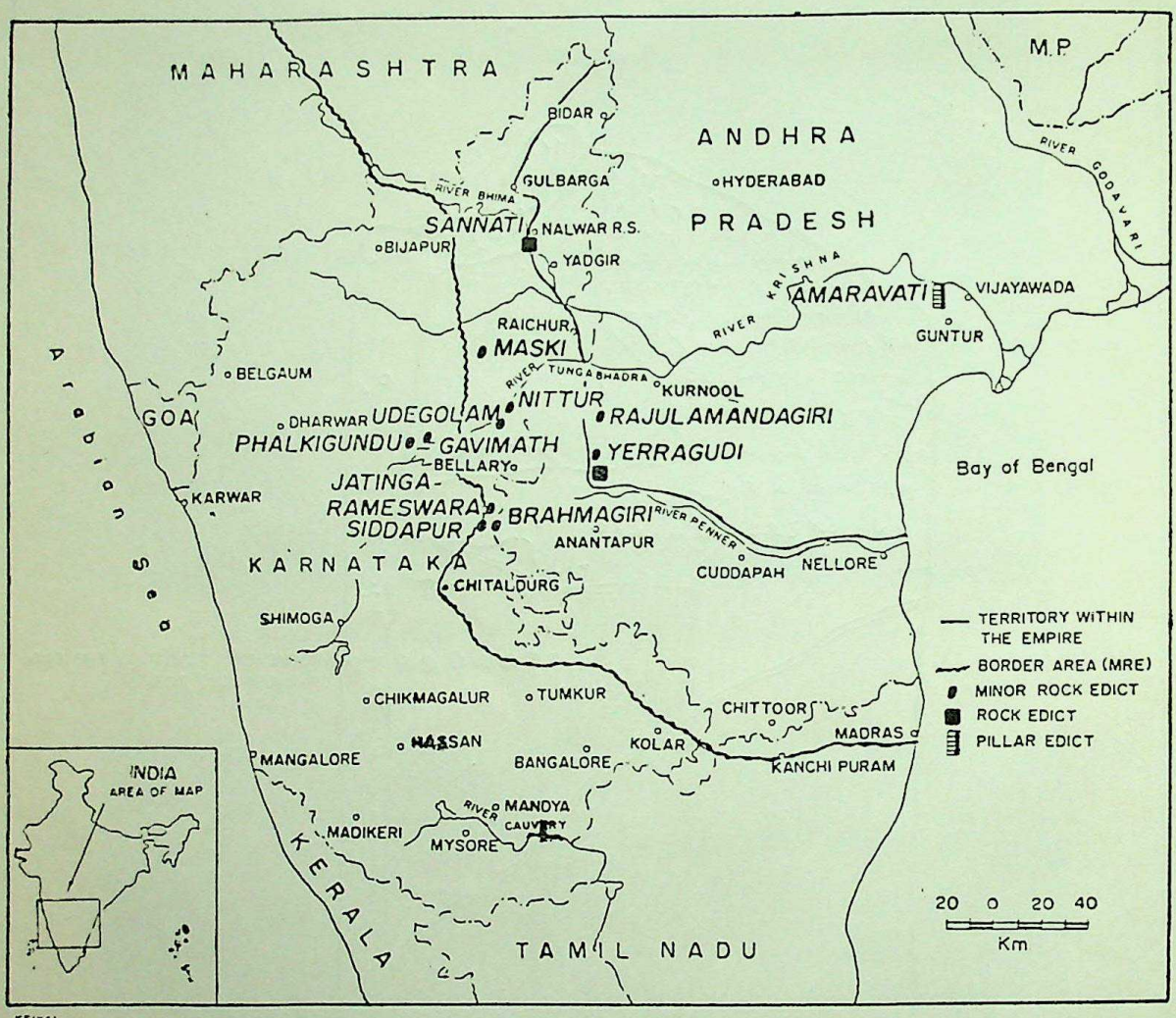
AŚOKAN EDICTS
IN ĀNDHRA-KARṆĀṬAKA



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Empire under the charge of a *Mahāmātra*, whereas Yerragudi and Jonnagiri (Suvarṇagiri) served as head-quarters of the southern part of the empire with an *Āryaputra* (Prince) at its behest. Moreover, Rājulamandagiri[17] where southern version of MRE I & II were also found is about 30 Km. north of Yerragudi. The toponym is of great significance. It literally means, a hill (*giri*) where a group (*manda*) of kings (*Rājulu*) congregated, perhaps during his southern sojourns. According to Brahmagiri and Siddapur MRE I and II Aśoka spent 256 nights on tour. It is quite in fitness of things to regard 'Rājulamandagiri' as the place where the Mauryan king Aśoka presided over a conference of local kings before issue of the Rock Edicts. The selection of places, particularly in the Deccan, for issue of Rock Edicts as at Yerragudi (Kurnool) and now at Sannati, district Gulbarga closely bordering Andhra (Fig. 2) clearly show that these territories were annexed (*Vijita*) to the Aśokan Empire some time after the issue of Minor Rock Edicts. The present find of Aśokan Rock Edict at Sannati assumes greater significance as the extensive fortified area is called *Raṇamaṇḍala* (war field). It remains now to be archaeologically proved whether this fortified area itself was the war-field which was perhaps finally annexed by the Mauryan king necessitating the issue of Rock Edicts.

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[5] P. B. Desai, "A New Buddhist Centre", *The Journal of the Karnatak University—Social Sciences*, Vol. IV, (Dharwad, April, 1968) pp. 3-8.

[6] More than hundred sculptures have been preserved in the Government Museum, Gulbarga. (See supra. note 3&4). far, 52-inscribed sculptures were reported from the so called *stūpa* sites. See G. S. Gai (Ed.) *Annual Report, Indian Epigraphy*, 1966-67 (Mysore, 1972) pp. 37-39 (31--inscriptions); *ARIE*, 1968-69 lists (11-inscriptions). Some inscriptions have been included in an article by M. S. Nagaraja Rao, "Brāhmī inscriptions and their bearing on the great Stūpa at Sannati", (1985) *vide* note-3 above.

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[8] A. Sundara, *Ibid.*, p. 23.

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[13] *Epigraphia Indica* III, pp. 234 ff.

[14] D. C. Sircar, *Aśokan Studies*, pp. 55-56.

[15] *Proceedings of the Indian History Congress* (Madras, 1914), p. 145.

[16] D. C. Sircar, *Aśokan Studies*, pp. 3-5. Boulder A, RE-I, II, III, V, VI, VII, XI & XIV; C, RE XIII; D, RE—XII; E, Re-IC.

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APPENDIX

(Synoptical Text of Aśokan Rock Edicts)

TWELFTH ROCK EDICT

Line—1:

I. *SANNATI:* .....**
II. *YERRAGUDI:* *Devānaṁpiye Piyadasi lājā sava-pāsa(ṁ)ḍani pavajitānī*
III. *GIRNAR:* *Devānaṁpiye Piyad(a)si rājā sava-pāsaṁḍāni cha(pa) (pa)vajitānī*
IV. *KALSI:* *(D)evānāpiye (P)iyadash(i) lājā shāvā-pāshaṁ(ḍān)i pav(a)jitā(n)ī*

Line—2:

I. *SANNATI:* .....**
II. *YERRAGUDI:* *(gihathāni va pūjayati dāne)na vividhāya cha p(ūja)ya no chu tathā dānaṁ va*
III. *GIRNAR:* *cha gharastani cha pūjayati d(ā)nena cha vivādhāya (cha) pūjāya pūjayati ne na tu tathā dānaṁ va*
IV. *KALSI:* *gahathāni vā pujeti dānena vividh(aye) cha puj(ā)ye n(o) ch(u) tathā dāne vā*

Line—3:

I. *SANNATI:* .....**
II. *YERRAGUDI:* *(pūjā) va Devānaṁpiye maṁna(ti) a(tha) (kiti sāla vaḍhi) s(iyā) sava-pāsaṁḍānaṁ*
III. *GIRNAR:* *pū(jā) va D(e)vānaṁpiyo maṁñate yathā kiti sāra-vaḍhī asa sa (va-pā)saṁḍānaṁ sār(a)-va*
IV. *KALSI:* *pūjā vā Devāna(ṁ)piye m(a)natiathā k(i)ta ś(ā)lā-v(a) ḍhi śiyāti ś(a)va-pāśaḍāna śālā-va*

Line—4:

I. *SANNATI:* .....**
II. *YERRAGUDI:* *ḍhi chu bahu-vidh(ā) tasa chu (i)yaṁ m(ū)l(e) a vacha gu(ti) kiti ata-pāsaṁ(ḍa)-(pūjā) va pala-pāsaṁḍa galahā*
III. *GIRNAR:* *ḍhī tu bahuvidhā tasa tu idaṁ mulaṁ ya vachī-guti kiṁti atpa-pāsaṁḍa pūjā va parapāsaṁḍa garahā*
IV. *KALSI:* *ḍhī nā bahuvidhā taśa chu inaṁ mule a ..... va(cha)-guti kiti t(i) ata-paśaḍa (v)āpūjā va pala-pāśaṁḍa-galahā*

Line—5:

I. *SANNATI:* .....*pā—la na*
II. *YERRAGUDI:* *(vā no) siyā a-pakalanasi la(hu)kā(va)-(siyā) ta(si) ta(si pa) kala(na)si (pū)je(taviya) va chu pala-pāsaṁḍ(ā) tena (te)na*
III. *GIRNAR:* *va no bhave aprakaraṇamhi lahukā va asa ..... tamhi tamhi prakaraṇe pūjetyā tu eva parapāsaṁḍā tena tana.*
IV. *KALSI:* *va no (śa)ya ap(a)k(a)l(a)naś(i) lahakā vā śiyā (ta)gi taśi pakalan(a)ś(i) pujetav(i)ya chu p(a)la-pā(śa)ḍā tena tena*

Line—6:

I. *SANNATI:* *ākā.....nā he.....*
II. *YERRAGUDI:* *ākālena hevaṁ kalaṁtaṁ ata-pāsamḍa(ṁ)bā (ḍhaṁ) vaḍha(ya)ti pala-pā(saṁ)ḍasa pi cha upakaleti tad-amnath(ā) kala(ṁta)*
III. *GIRNAR:* *prakaraṇena evaṁ karuṁ ātpa-pāsaṁḍam cha vaḍhayati pāra-pāsaṁḍasa cha upakaroti tad-aṁñathā karoto*
IV. *KALSI:* *akālana heva kalata ata-pāśaḍa baḍham vaḍhiyati pala-pāśaḍa pi vā upakaleti tadā anatha kalata*

Missing Text

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Line-7:

I. *SANNATI:* *taṁ aṁta pāsāḍham cha chha(nati)pāsa.....śagalahati(?)*
II. *YERRAGUDI:* *a(ta)pāsaṁḍaṁ cha chhanati pala-pāsaṁ (ḍasa) pi cha apakale (ti) e hi kechi ata-pāsaṁḍaṁ pūjayeti (pa)la-pāsaṁḍaṁ v(ā) galahati*
III. *GIRNAR:* *ātpa-pāsaḍaṁ cha chhaṇati para-pāsaṁḍasa cha pi apakaroti yo hi kochi ātpa-pāsaṁḍam pūjayeti para-pāsaṁḍam v(a) garahati*
IV. *KALSI:* *ata-pāśaḍa cha chhanati pala-pāśaḍa pi vā apakaleti ye h(i)kecha (a)ta-pāśaḍa punāti pala-pāshaḍa vā ga (la)hati*

Line—8:

I. *SANNATI:* *save ata-pasadha.....(Utama).....ga ata pasadha se sama*
II. *YERRAGUDI:* *save ata-pāsaṁḍa-bha(tiyā va) ki(ti a) ta-pāsaṁ(ḍa)ṁ di(paye)ma (ti)se cha mana tathā kalaṁtaṁ b(ā)ḍhatale upahaṁti ata-pāsaṁḍaṁ se sama*
III. *GIRNAR:* *savaṁ ātpa-pāsaṁḍa-bhatiyā kiṁti ātpa-pāsaṁḍam dipayema iti so ch pun tatha karāto ātpa-pāsaṁḍa(ṁ) bāḍhataraṁ upahanāti ta sama*
IV. *KALSI:* *shave ata-pāshaṁ(ḍa)-bhatiyā vā kiti ata-pāshaṁḍa (d)ipayema she cha punā tathā kalaṁtaṁ bāḍhatale up(a) haṁt(i) ata-pāshaṁḍashi shama*

Line—9:

I. *SANNATI:* *vāye (va) sa (du).....sava pā saṁ ḍa*
II. *YERRAGUDI:* *vāye(va)sādhu ki(ti) aṁnam-anāsa (dhaṁmaṁ sunevu) cha susūseyu cha hevaṁ hi De(vā)-naṁpiya(sa i) chhā kiti sava-pāsaṁḍa*
III. *GIRNAR:* *vāyo eva sādhu kiṁti (a) ñamaṁñasa dhaṁmaṁ sruṇāru cha susuṁsera cha evaṁ hi D(e)vānaṁ piyasa ichhā kiṁti sava-pāsaṁḍa*
IV. *KALSI:* *vāye vu shādhu kiti aṁnamanashā dhaṁmaṁ shune(y)u chā shushusheyu chā ti hevaṁ hi devānaṁpiyashā ichha kiṁti sava-pāshaṁḍa*

Line—10:

I. *SANNATI:* *bahu-suta kiyā nāgama.....sa va gina vata.....cha saghati*
II. *YERRAGUDI:* *bahu-sutā cha kayān-āgamā cha huvey(u ti) e (cha) tata tata (pasaṁnā)te hi vataviy(e) devanaṁpiye no tath(ā) dānaṁ v(ā) (pū)ja v(ā) maṁnati*
III. *GIRNAR:* *bahu-srutā cha asu kal(ā)ṇāgamā cha (a) su ye cha tatra tata prasaṁnā tehi vatavyaṁ devā-naṁpiyo no tathā dānaṁ va pūjāṁ va maṁñate*
IV. *KALSI:* *bahu-shutā chā kayānāgā cha huveyu ti e (cha) tata t(a)t (a) p(a)sh(aṁ)nā te(hi va) taviye devānāpiye no tathā dānaṁ vā pūjā·vā maṁnat(i)*

Line—11:

I. *SANNATI:* *atha kiti.....dha—ka.....mahā (mātā)*
II. *YERRAGUDI:* *atha kiti sāla-vāḍhi si(yā) sava-pāsa(ṁ)-ḍānaṁ ti (ba)huk (ā) cha etāye a(ṭhā)ye viyāpaṭa dhaṁma(ma)hāmātā ithi dhiya(kha) mahāṁ(ā)tā*
III. *GIRNAR:* *yathā kiṁti sāra-vaḍhī asa sarva-pāsaḍānaṁ bahakā cha etāya athā vyāpatā chaṁma-mahāmātā cha ithījhakha-mahāmātā cha*
IV. *KALSI:* *athā kiti sh(ā)lā-v(a)ḍhi śiyā shava-pāshaṁḍatiṁ bahukā ch(ā) etāyāṭhāye viyāpaṭā dha(ṁ)ma-mahāmāta ithidhiyakha mahāmātā*

Line—12:

I. *SANNATI:* *vaca(rāji)mika.....ne dhini.....*
II. *YERRAGUDI:* *vacha-bhūmiko(kā) cha aṁne cha nikāyā iyaṁ (chu e) tasa phale (ata-pāsaṁḍa-vaḍhi) cha hoti dhaṁmasa cha d(i)panā ti*
III. *GIRNAR:* *vacha-bhūmikā cha aṁe cha nikāyā ayaṁ etasa phala ya ātpa-pāsaṁḍa-vaḍhi cha hoti dhaṁmasa cha dī(a)nā*
IV. *KALSI:* *vacha-bh(u)mikyā ane vā(n)iky(ā)y(ā) iyaṁ cha etishā phale yaṁ ata-pāshaṁḍa-vaḍhi chā hoti dhaṁmasha chā dipanā*

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TRANSLATION

1. King Priyadarsin, Beloved of Gods, honours men of all religious communities.

2. Both with gifts and with honours of various kinds (irrespective of whether they are ascetics or house-holders).

3. But the beloved of Gods does not value either the (offering of) gifts or the honouring (of people) so (highly) as the following, *viz.*, that there should be a growth of the essentials of *Dharma* among men of all sects.

4. But a promotion of the essentials (in *Dharma* is possible) in many ways—its root is thus guarding (ones) speech, that neither praising ones own sect or disparagement of other sects should take place.

5. It should be moderate in every case even on appropriate occasions.

6. If one is acting this, he is promoting his own sect and benefitting other sects.

7. If a person acts otherwise (he) not only injures his own sect very severally but also harms other sects, whosoever praises his own sect or blames other sects.

8. All (this) out of devotion to his own sect with a view to glorifying his own sect if he is acting thus, he rather injures his own sect severally.

9. Therefore concord alone is meritorious *i.e.* they should both hear and obey each others morals. For this is the desire of Devānāṁpriyā that all sects.

10. Become well informed and acquire pure knowledge of the doctrine and those who are attached to their respective (sects) out to be spoken to (as follows). Devānāṁpriya does not value either the (offering of) gifts or honouring (the people) so highly as the following.

11. That promotion of the essentials of all sects should take place and many officers are occupied for this purpose, the *Mahāmātras* in-charge of *dharma* the *mahāmātras* in-charge of the (matters relating to) ladies.

12. The officers in-charge of (my cattle and) pasture lands and other classes (of officials). And the result of their acts is the promotion of one's own sect and the glorification of *Dharma*.

FOURTEENTH ROCK EDICT

Line—1:

I.	*SANNATI:*	*(i) yaṁ dhamma-lipi devānaṁ(pi) yeṇa.....vasa*
II.	*YERRAGUDI:*	*iyaṁ dha(ṁ)ma-lipi devānaṁpiyena piya-dasin(ā) lājinā*
III.	*GIRNAR:*	*ayaṁ dhaṁma-lipi devānaṁpriyena priyadasinā r(a)ñā*
IV.	*KALSI:*	*iyaṁ dhama-lipi dev(ānaṁp)i(y)e(n)ā piya-dasinā lājinā*

Line—2:

I.	*SANNATI:*	.....**
II.	*YERRAGUDI:*	*li(khā)pitā athi yeva sam(khi)tena athi majhimena athi vitha (ṭenā)*
III.	*GIRNAR:*	*l(e)khāpitā asti eva samkhit(e)na asti majhamena asti vistatena*
IV.	*KALSI:*	*likhāpitā athi yevā sukhi-tenā (a)thi mujhimenā athi vithaṭena*

** Missing Text

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Line—3:

I. *SANNATI:* *no hi samatisa veghava.....*
II. *YERRAGUDI:* *no hi savatā sa(vē) gha(ti)te cha*
III. *GIRNAR:* *na cha sarvaṁ (sa)rvata ghaṭitaṁ*
IV. *KALSI:* *no hi sabatā save(gha)ṭite*

Line—4:

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Line—3:

I. *SANNATI:* *no hi samatisa veghava.....*
II. *YERRAGUDI:* *no hi savatā sa(ve) gha(ti)ṭe cha*
III. *GIRNAR:* *na cha sarvaṁ (sa)rvata ghaṭitaṁ*
IV. *KALSI:* *no hi sabatā save(gha)ṭite*

Line—4:

I. *SANNATI:* .....**
II. *YERRAGUDI:* *mahālake hi vijite bahu cha likhite likhā-payisami cheva nikāyam*
III. *GIRNAR:* *mahālake hi vijitaṁ bahu cha likhitam likhā-payisaṁ cheva*
IV. *KALSI:* *mahālake hi vi jite bahu cha likhite lekhāpeśāmi cheva nikyaṁ*

Line—5:

I. *SANNATI:* .....*tasa tasa (aṭh)sa madhuliyāye (yena) jana tatha.....*
II. *YERRAGUDI:* *athi chu heta (pu)na (pu)nala (pite tasa tasa) aṭhasa mādhuliyāye ena (ja)te(ne) tathā (paṭipajeyā)*
III. *GIRNAR:* *asti cha eta kaṁ puna pun vutaṁ tasa tasa athasa mādhuratāya kiṁti jano tathā paṭipajetha*
IV. *KALSI:* *athi chāheta puna pun(ā) la(pi) t(e) tasha tashā athashā madhuliyāye yena jane tathā paṭipajeyā*

Line—6:

I. *SANNATI:* .....*yā kālanaṁ va ālochayatu lipika(sa) pa(ra)dh—nu.....*
II. *YERRAGUDI:* *(se siya ata ki) chhi asamati likhite ḍesaṁ vā saṁ(kha) saṁkhāyāyā kālanaṁ va ālochayitu lipika(l-āpalā)dhena vā ti*
III. *GIRNAR:* *tatra ekadā asamāt(a)ṁ likhita(ṁ) asa desaṁ va sachhāya (kā)raṇaṁ va (a)lochetpā lipikarāparadhena va*
IV. *KALSI:* *she shiyā ata k(i)chhi a samati likhite dishā va shaṁkhāya kālanaṁ vā alochayitu li(p)ika-lapalādhena vā*

** Missing Text

TRANSLATION

1. This record relating to *Dharma* has been caused to be written by king Priyadarśi, Beloved of the Gods.

2. Either in abridged (form) or of middle (size) or at full length.

3. And the whole was not suitable everywhere.

4. For (my) dominions are wide, and much has been written, and I shall certainly cause still a lot (more) to be written.

5. And (some) of this has been stated again and again owing to their sweetness, so that people may act accordingly.

6. Thus there may be some (topic) which have been written incompletely either on account of the locality, or because (my) motive was not liked or owing to a fault of the scribe.

I am grateful to the Director General, ASD for kind permission to publish this article. I am also beholden to Dr. R. C. Sharma, Director, Indian Museum, Calcutta for all suggestions and acceptance to publish in the Bulletin.

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KHAROSHTĪ GRAFFITI OF THE KUSHĀṆA AGE FROM NORTHERN KASHMIR

B. N. MUKHERJEE

A

IN recent years large concentrations of graffiti on rock have been discovered in the areas of Alam Bridge, Chilas and Hunza, all situated in the upper region of modern Kashmir, now occupied by Pakistan. Alam Bridge is a few kilometers to the west of the confluence of the Gilgit and the Indus rivers. It is some miles to the north of Bunji and to the west of Rondu on the Indus. Near and to the east or south-east of Alam Bridge graffiti on rock have been found in three (or five?) groups. Much to the south of Alam Bridge and Gilgit and to the west of Astor is Chilas on the Indus. The ancient name of the district was Śilavaṭa (Al-Bīrūnīs' Shiltas). In this area scholars have noticed seven graffiti bearing sites on the right and ten similar sites on the left of the Indus. The region of Hunza is much to the north of Alam Bridge and near Nager on the left bank of the Hunza river. The locality of Hunza is on the other side of the river. Opposite to Hunza and on the left side of the Hunza river and not very far from the village called Ganesh is a massior rock or rather a group of rocks bearing graffiti.

The graffiti at these sites include inscriptions beside drawings of great religious, iconographic and ritualistic importance. The inscriptions found in the locality of Alam Bridge have been edited by G. Fussman in the *Bulletin del'École Francaise d' Extrême—Orient* (Paris, 1978, Vol. LXV, pp. lf). The inscriptions are in the Brāhmi, Kharoshṭī[1] and Tibetan scripts and in the Gandhari Prakrit, Sanskrit, Hybrid Sanskrit, Apabhraṁśa, Tibetan and pre-Burushaski (?) languages.

The inscriptions at Chilas have been edited or noticed by A. H. Dani in the book called *Chilas, The City of Nanga Parvat (Dyamar)* (Islamabad, 1983, pp. 58f). These are in the Brahmī, Kharoshṭī, Chinese and Sogdian characters and in Gandhari Prakrit, Sanskrit, Chinese and Sogdian languages.

The inscriptions on the rock or rather rocks of Hunza have been edited or noticed by A. H. Dani in the *Journal of Central Asia* (Islamabad, 1985, vol. VIII, no. 2, pp. 5f). These are in the Brāhmī, Kharoshṭī and Chinese characters and in Prakrit, Sanskrit and Chinese languages.

According to the editors, several Kharoshṭī epigraphs found at these sites refer to Kushāṇa kings and/or are dated in the Kanishka Era. In this paper we propose to re-examine these records.

B

Kharoshṭī inscriptions in the area of Alam Bridge are mainly noticeable at two sites (designated as points A and B by G. Fussman).[2] None of these refers to a Kushāṇa king. But a few of them are dated

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in years below the figure of 100 and are palaeographically assignable to the Kushāṇa age. These have been correctly attributed by Fussman to the era of Kanishka (I).[3] These can be listed as follows:

1. AK1 (Fussman's no. 7). It is an unfinished inscription on rock no. 7. Fussman reads it as *....tra saṁ* 4.[4] Since the characters are not recognisible in the photograph published by Fussman (pl. XII, no. 19 of his article), we cannot check his reading, which apparently refers to "the year 4 (and to) somebody, the son (*putra*) of some person".

2. AK2 (Fussman's no. 5, 21). It is a much effaced inscription on rock no. 5. Fussman reads it as *Sa* 4 [+] 1 *hadayasa....p* [*u*]*tra*.[5] But the letters in the published photograph (pl. IX, no. 14 of Fussman's article) are too indistinct to allow us to give opinion on his reading. Fussman's reading means "[In the] year 5 the son of Hṛidaya.....".

3. AK3 (Fussman's no. 6, 6). This inscription on rock no. 6 is very much effaced. Fussman reads it as *Sa* 4[+]4[+]1 *Budhapa*.....[6] The poor quality of the photograph (pl. XI, no. 16 of his article) published by him does not allow us to be sure of the veracity of his reading.

4. AK4 (Fussman's no. 8). This inscription is engraved on rock no. 8. It can be read as follows[7] (figs. 1 and 2):
   L1. *Yubharajṇa Vas(u)dharivaraṇa*
   L2. *sabrati sa* 4 [+] 4 [+] 1 (?) (blank uninscribed space) *bhavasi* (or *ti*)
   L3. *ade* (?) *sahi*
   The inscription can be translated as follows:
   This is [done] at this moment (*samprati* < *sabradi*) [in the] year 9 (?) by the orders (*ādeśaiḥ* > *ādesahi*) of the Heir apparent (or Crown Prince) Vasu(ṁ)dharī-varṇa.
   Our reading slightly differs from that of Fussman.[8] For a form of *da* similar to that of this letter in l. 3 see the inscription of Matrava of the year 77 of the Azes Era.

5. AK5 (Fussman's no. 10, 3). This inscription is engraved on rock no. 10. It can be read and translated as follows[9] (fig. 3):

   Text

   L1. *saṁ* (4 [+] 4 [+] 1) *Maraṁputru Ḍanilasraṇu*
   L2. *sabradi*

   Translation

   Danilasraṇu, the son of Maraṁ, now (or at this moment) in the year 9 [is inscribing this].

   The letter read as *sra* may also be transcribed as *sa* if it is taken to convey a special pronunciation of the dental sibilant.

6. AK6 (Fussman's no. 6, 7). This inscription is engraved on rock no. 6. It is almost effaced (pl. XI, no. 16 of Fussman's article). Fussman has read it as follows:[10]
   Sa × [+] 1 *Ḳasuksha*.....
   However, the very poor quality of the reproduction of the graffito in Fussman's article does not allow us to check his reading.

7. AK7 (Fussman's no. 10, 5). This inscription is inscribed on rock no. 10. This graffito of one line

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continues below the first line of inscription no. AK5 and ends shortly before the second line of the epigraph no. AK5. This document can be read and translated as follows[11] (fig. 4):

Text

L1. *Dhammaṇaputro Ne'i'usa(sa)* [*sa*] 20 [+] 20 [+] 20 [+] 20 [+] 4 [+] 4 [+] 1

Translation

"Of Ne'i'usa, the son of Dhammaṇa (< *Dharmajña*, "one who knows Dharma"), [in] (the year) 89".[12]

The forms of the letters, particularly of *sa* and *da*, attribute the above records to the Kushāṇa age. Hence the years below the figure of 100, in which the graffiti are dated, cannot but be referred to the Era of Kanishka I. The documents of the years 4, 5 and 9 belong to the period of Kanishka I, while the graffito of the year 89 is to attributed to the reign of Vāsudeva I. The area of Alam Bridge was apparently in the domain of Kushāṇa rule from at least the time of Kanishka I to that of Vāsudeva I.

C

Two of the Kharoshṭī graffiti found at Chilas have been considered by A. H. Dani as referring to Kushāṇa monarchs. One of these (no. 53) is engraved on a rock at the site of Chilas X. Dani reads it as *Uvimadasakasa* (see pl. no. 53 on p. 73 of his monograph on Chilas mentioned above) and interprets it as referring to the Kushāṇa king V'ima Kadphises.[13] But the inscription can be clearly read as *Uvimaṁda Sakasa*, meaning "of Saka Uvimaṁda" (fig. 5). So, no graffito in the Chilas area refers to V'ima.

On a rock at the site of Chilas II, A. H. Dani reads a Kharoshṭī inscription as follows[14] (see pl. 89 on p. 113 of his book):

L1. *Vaẓshkasa Ka'isaha(ra)(sa)*
L2. *rajatirajasa*
L3. *devavratasa*

Dani sees in *Va'eshka* (which he likes to read alternatively as *Jhashka*) a reference to Vāsishka. He thinks that the titles *Ka'isahara* = *Ka'isara*, noticeable as a royal title in the Ara inscription of Kanishka II, supports his claim.

We however read the inscription as follows[15]:

L1. *Jhaṁda devasa va'isa ha*
L2. *-ḍadita* (*suṇo*) (?)
L3. *od(ē)vasa*

Though the reading of the text is not very certain, there is no doubt that it does not refer to king Vāsishka.

So far no graffito referring to a Kushāṇa king has been found in the Chilas area. This by itself, however, does not exclude the locality from the Kushāṇa rule.

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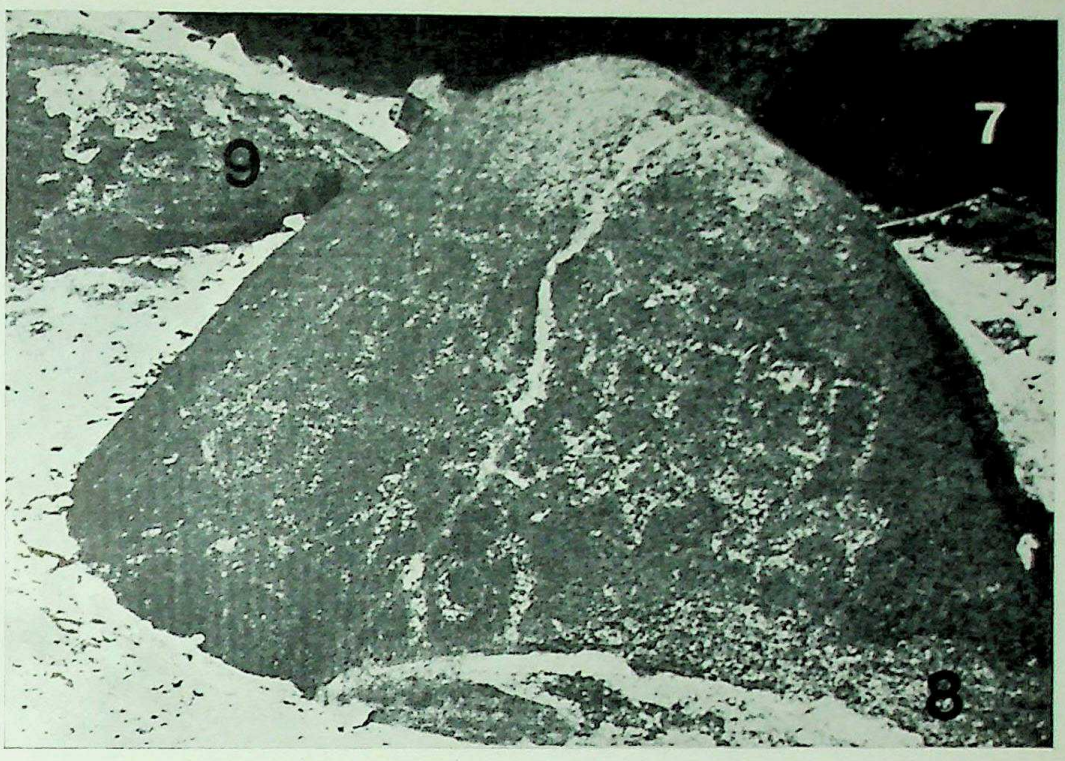

Fig. 1

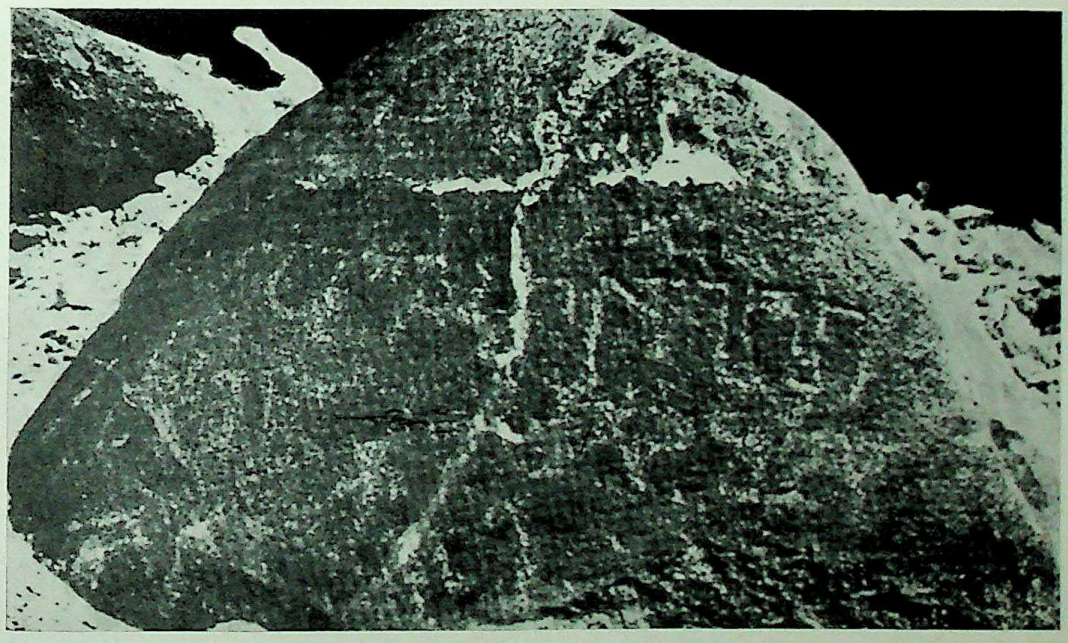

Fig. 2

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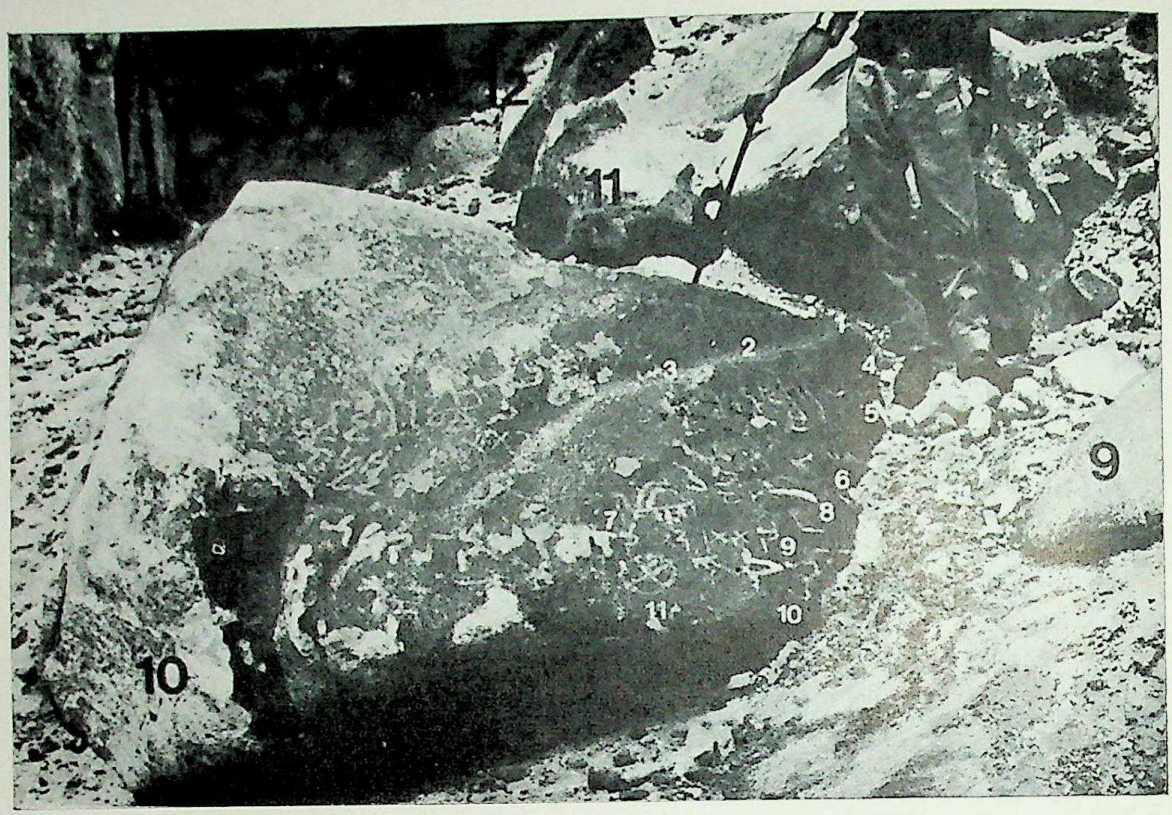

Figs. 3 and 4

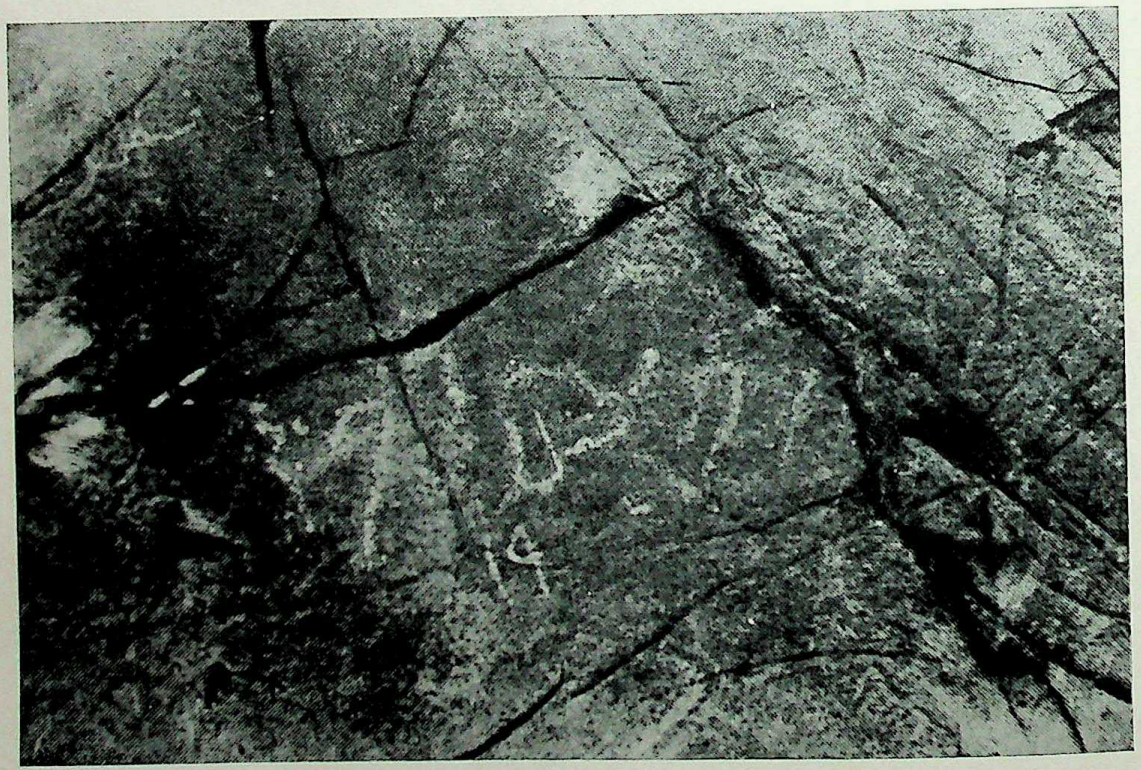

Fig. 5

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Fig. 6

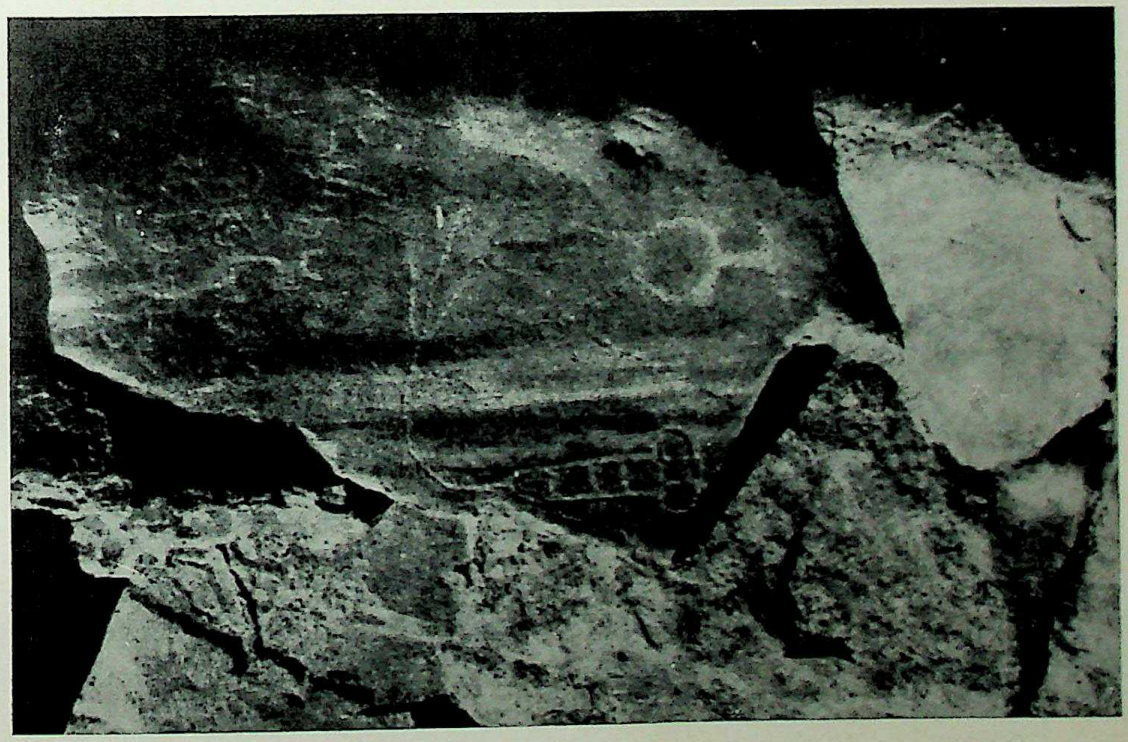

Fig. 7

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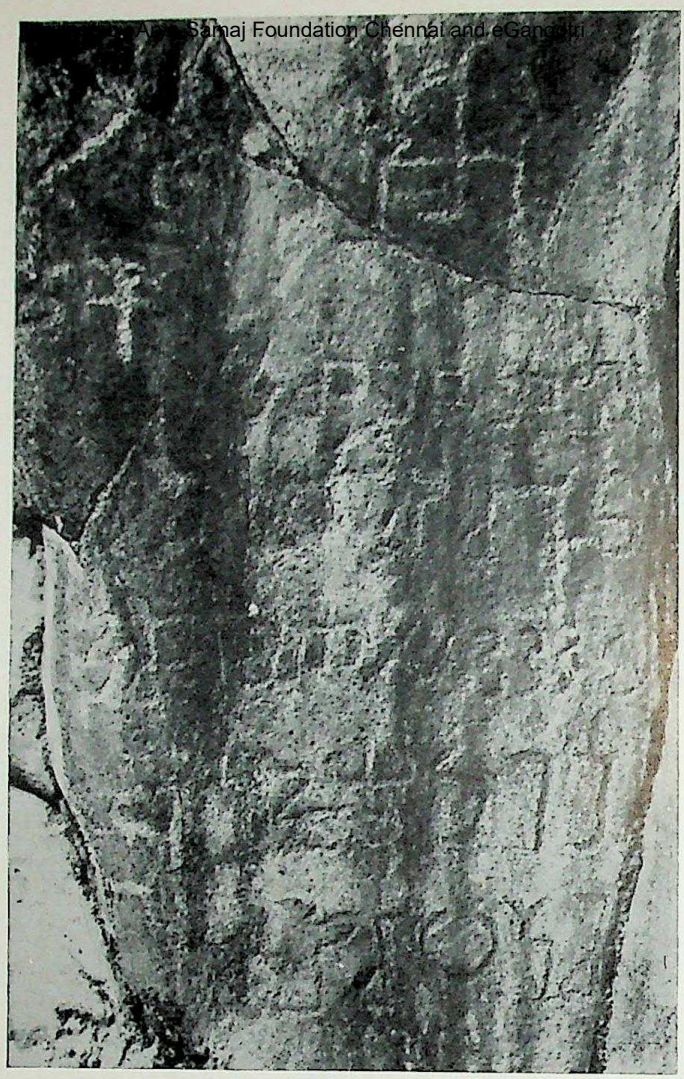

Fig. 8

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Fig. 9

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D

As a contrast to the rocks in the Chilas region the above-mentioned group of rocks in the Hunza area bear several inscriptions indicating Kushāṇa rule. These graffiti in the Kharoshṭī script and Gandhārī Prakrit are found on rock no. 1 and rock no. 2.[16] These are catalogued below.

8. HK1 (Dani's no. 17). This inscription occurs on the eastern face of rock no. 1. It is inscribed in an inclined fashion a little above the head of a standing male figure wearing a peaked helmet or crown (see pl. 25 of Dani's article). It can be read and translated as follows (fig. 6):

Text

L1. *(Ma)haraja U (or Du)Vimo*
L2. *(Ka)dhatpri(sa)*

Translation

The Great King U (or Du)Vima Kadhatprisa.

If the reading V'ima is acceptable, it may refer to V'ima. In that case the reading *Kadhatprisa* (wrongly read as *Kadhatphrisa*[17] by Dani) may be taken a variant or corruption of the term *Kadaphisa* < Old Iranian **Kāta-paisa*, meaning "of honoured form". This expression was used as an epithet by V'ima and his father Kujula.[18]

9. HK2 (Dani's no. 9). This graffito is inscribed on the eastern face of rock no. 1. A. H. Dani has read it as follows (see pll. 17 and 19 of Dani's article)[19]:

(Gushaṇa)deva Maharayasa....
Kanishkasa saṁghe dana

Very poor quality of the reproduction of this graffito in Dani's article does not allow us to verify his reading. However, if it is correct, the epigraph refers to a "gift in (i.e. to the Buddhist congregation of the Lord of Gushaṇa (=Kushāṇa), the Great King Kanishka". Here the word *saṁgha*, literally meaning a Buddhist congregation, may allude to a monastery where a congregation of monks could reside. It was founded by and/or named after Kanishka I. It could have been the great Kanishka-vihārā, mentioned *inter alia* in the Shahji-ki-dheri casket inscription, or some other monastery associated with the Kushāṇa monarch.[20]

10. HK3 (Dani's no. 53). This graffito is inscribed on the southern face of rock no. 1. It has been read and translated by Dani as follows[21]:

Text

Saṁ 4 [+] 1 [+] 1 [+1] *mase Jeṭha atra di* 4 [+] 1 *Nathuvu putra Dharmasena*

Translation

"In the year 7, during the month of Jeṭha (Jyaishṭha), on 5th day, Dharmasena, the son of Nathuvu."

Dani does not appear to have published any photograph of this graffito. So we cannot offer our reading.

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11. HK4 (Dani's no. 8). This graffito occurs on the eastern face of rock no. 1. A. H. Dani has read it in the following way[22] (see pll. 17 and 19 of Dani's article):

L1. *Maharajasa devaputrasa Huvi(shkasa)*.....20 [+] 10 [+] 4
L2. ....*Saṁghamitra*....

If Dani's reading is correct, the graffito refers to the reign of Huvishka and is dated in the year 34 of the Kanishka Era. However, we are not sure of the reading due to indifferent quality of the photographs of the document published by Dani. 15

12. HK5 (Dani's no. 10). This graffito occurs on the eastern face of rock no. 1 (see pl. 16 of Dani's article). It can be read and translated as follows (fig. 7):

Text

L1. *(Gu)shana Maharaya H(u)vash(ka)*
L2. *Rośomoya*..... 16

Translation

The Kushāṇa Great King Huvishka....Rośomaya....

In this graffito *va* is placed below and not after *Hu* in the name of the monarch.

13. HK6 (Dani's no. 16). This graffito is on the eastern face of rock no. 16. It has been read by Dani as follows[23] (see pl. 25 of Dani's article):

L1. *(Ku)shaṇasa*....
L2. *saṁ* 20 [+] 20 [+] 4 [+] 4
L3. *Subhadraputra*
L4. *dania* 17.

The reproduction of this graffito in Dani's paper is poor as well as incomplete.[24] So we are not sure of the reading. If the reading is correct it refers to the year 48 of the Kanishka Era when Huvishka was the ruling King.

14. HK7 (Dani's no. 15). This inscription, unlike other relevant graffiti, is boldly engraved on the eastern face of rock no. 1[25] (see pl. 22 of Dani's article). It can be read and translated as follows (fig. 8):

L1. *Dh(i)ro Poṇeva-putr(o)*
L2. *Khavi Usug(o) (hi)tu*
L3. *saṁ* 20 [+] 20 [+] 20 [+] 4 [+] 4 *Rapasaṇa-putro*
L4. *Revada 'iya hu Revada*
L5. *Uchamaṁnu sata* (or *ba)tu* 18.

Translation

Wise poet (*Kavi* > *Khavi*) reckoned as (*hita*, c.f. *abhihita*) Usuga, the son of Poṇeva (< Praṇva?).

Year 68, Revada, the scion of the Rapasa family, was here. Revada (is) always (*satata*) (or everywhere) (*sarvatra*?) highminded (Uchchamanyu).

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Dhi in line 1 is placed transversely below the next letter (*ro*). The letters *'i* and *ya* are engraved transversely between *da* and *hu* in line 4. The first two lines may well form a separate inscription.

Above line 1 there is a monogram which can be a combination of Kharoshṭī letters *pra*, *'i* and *sa* or *pro*, *'o* and *sa*, or *pro*, *'a* and *se*. In any case Dani is surely wrong in taking the monogram as representing a form of Buddhist *triratna*.[26]

15. HK8 (Dani's no. 30). This graffito is on the south-eastern face of rock no. 1. Dani has read it in the following way[27] (see pll. 28 and 29 of Dani's article):

L1. *Saṁ* 20 [+] 20 [+] 20 [+] 10 *Somasi.....kaga.....*
L2. *putro sa.....Budhamitra*

The poor quality of the photograph of the inscription published by Dani does not allow us to offer our reading. We can only verify the date and the words *somasi* and *putro* and the letter *sa* after *putro*.

16. HK9 (Dani's no. 54). This inscription is engraved on rock no. 2. It can be read and translated as follows[28] (fig. 9):

Text

.....Khoshilamitra p(o)tra (ya)'ugu Naḍa'ulaputra saṁ (20 [+] 20 [+] 20 [+] 10)

Translation

.....grandson of Khoshilamitra (and) son of Yavuga Naḍa'ula, year (70).

The date is not clear in the photograph of the graffito published by Dani (see pl. 41 of his article). So, we are not sure of the reading of the date. We cannot also trace the word *dana* (*dāna*) after the date as read by him.

17. HK10 (Dani's no. 32). This graffito is on south-eastern side of rock no. 1. Dani has read and translated it as follows[29] (see pl. 28 of his article):

L1. ....*Saṁ* 20 [+] 20 [+] 20 [+] 10 [+] 4 [+] 1 [+] 1 *mase divase....*
L2. .....*sarvabudhaṇa* (*puhaṣ*) (*sic*).

Translation

"For the merit of all the Buddhas in the year 76, during the month.....on the day....."

Dani omits (*puhaṣ*) while furnishing an eyecopy of the inscription.[30] The indifferent quality of the reproduction of the graffito in Dani's article does not allow us to suggest our reading.

18. HK11 (Dani's no. 39). This graffito occurs in the area of south-eastern corner of rock no. 1. It has been read and translated by Dani as follows[30a]:

Text

L1. *Balamitraputro Bo*
L2. *samitro sabatu*
L3. saṁ 20 [+] 20 [+] 20 [+] 20.....

गुरुकुल कांगड़ी विश्वविद्यालय हरिद्वार
078702

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Translation

"The son of Balamitra, Bosamitra may live (well) (*sic.*). In the year 80...."

Dani does not indicate this graffito in the plates in his article. So we cannot offer our reading. However, it may be pointed out that if the last words in l.2. is to be translated as "may live" (i.e. may exist), the reading of the word concerned should be *bhavatu.*

19. HK12 (Dani's no. 51). This graffito is on the southern face of rock no. 1. A. H. Dani has read and translated it as follows[31] (see pl. 31 of his article):

Text

Buna'uḍa saṁ 20 [+] 20 [+] 20 [+] 20

Translation

"Buna'uda in the year 80".
We can only verify the reading *Buna'üḍa* in the relevant plate.

20. HK13 (Dani's no. 13). This graffito is on the eastern face of rock no. 1. Dani has read and translated it as follows[32] (see pl. 2 of Dani's article):

Text

L1. ....*saṁ* 20 [+] 20 [+] 20 [+] 20 [+] 1
L2. ....(*a*)*tha divasa*....

Translation

"In the year 81.....on the 8th day."

The reproduction of the epigraph in Dani's article is too poor to admit of any checking of his reading. However, it may be noted that if the first readable word of line 2 is to be translated as "the 8th" (eighth), its reading should be *aṭha* (not *atha*). (See also p. 64 of Dani's article.)

21. HK14 (Dani's no. 45). This graffito is on the southern face of rock no. 1. Dani has read and translated it as follows[33] (see pl. 31 of his article):

Text

L1. *Saṁ* 20 [+] 20 [+] 20 [+] 20 [+] 1 [+1] *mase divase*
L2. *Agimitra.....na putra*

Translation

"In the year 82, during the month of.....on the day.....Agnimitra.....na's son."

The reproduction of this epigraph in Dani's article is too indistinct to allow us to suggest our reading.

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22. HK15 (Dani's no. 34). This inscription is in the area of south-eastern corner of rock no. 1. Dani has read it as follows[31] (see pl. 29 of his article):

Text

L1. *Mitravardhanaputro Kshatrapo Dharmarakshitaputro*
L2. *saṁ* 20 [+] 20 [+] 20 [+] 20 [+] 1 [+] 1 [+] 1 *mase daśa divase.....sabatu*

If the reading is correct, which cannot certify for want of good photograph, the inscription can be translated as follows:

Mitrabardhana's son (and) Kshatrapa Dharmarakshita's son. (In) the year 83, on the 10th day of the month, at this moment (*sabatu* < *savati* < *samprati*).

23. HK16 (Dani's no. 21). This graffito is on the south-eastern of rock no. 1. Dani has read and translated it as follows[31a] (see pl. 28 of Dani's article):

Text

L1. *Chatra.....(Ksha)trapasa Bhulikaḍalasa nupu(tra)*
L2. *Saṁ* 20 [+] 20 [+] 20 [+] 20 [+] 10 [+] 1 *masasa panasa.....*

Translation

"In the month of panasa, in the year 91.....the grandson of Bhulikaḍala.....Chatra."

It is not possible to verify Dani's reading with help of the photograph published by him. If Dani's reading is correct, Bhulikaḍala was a Kshatrapa. The name *Panasa* may stand for *Panemasa*, i.e. Macedonian month called Panemos corresponding to June-July.

Unfortunately Dani's readings of the majority of the above-noted inscriptions from Hunza cannot be verified by us due to very poor quality of their reproductions in his article. But those which are readable on the plates clearly allude to Kushāṇa rule in the region concerned. If all the records are taken into account, this rule should have been there at least from the period of V'ima to that of the year 91 of the Kanishka Era and so up to the last known decade of the reign of Vāsudeva I. To his reign we should refer all records dated in the years 68 (HK7), 70 (HK8 and HK9), 76 (HK10), 80 (HK11 and HK12), 81 (HK13), 82 (HK14), 83 (HK15) and 91 (HK16). Inscriptions dated in the years 34 (HK4), and 48 (HK6) are to be assigned to the reign of Huvishka. In fact, Huvishka is mentioned in the graffito of the year 34. Another undated graffito (HK5) also records the name of this monarch. The epigraph of the year 7 (HK3) belongs to the period of Kanishka I, whose name is inscribed in an undated document (HK2). If the inscription no. HK1 (Dani's no. 17) really refers to V'ima, it may be the earliest datable record of Kushāṇa rule in the Hunza area.

E

It appears from the above survey of graffiti on rocks in the areas of Alam Bridge, Chilas and Hunza that the Chilas region has not yielded any inscription referring to a Kushāṇa monarch or a date in the Kanishka Era. Six graffiti at Alam Bridge are dated in the years of the Kanishka Era. But none of these refers to a Kushāṇa King by name. On the other hand, the relevant graffiti in the Hunza area either record the date (in the Kanishka Era) or the name of the relevant King or both (at least in one case) (no. HK4).

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One of the relevant graffiti at Alam Bridge (AK4) refers to a *yuvaraja* or crown prince. He might have belonged to a local family of subordinate rulers. Royal title *maharaja* or *maharaya* (*mahārāja*) occurs in three records in the Hunza area (HK1, 2, 4 and 5). The epithet *devaputra* appears in graffito no. HK4. The name *Gushana* (< *Kushāṇa*) is noticeable in two documents (HK2 and 5). Of the administrative designation *Kshatrapa* appears in graffiti nos. HK15 and 16. As it is well-known, the Kushāṇas ruled their provinces of their empire through the governors designated as Mahākshatrapa and Kshatrapa.[35]

It is interesting to note that the title *yavuga*, known to have been used by the Kushāṇa king Kujula Kadphises,[36] was used by a person called Naḍa'ula [referred to as ya'ugu in inscription no. HK9 (Dani's no. 54)]. The graffito does not indicate him as a member of the royal Kushāṇa family. So this evidence shows that even during the Kushāṇa rule the title *yavuga* could be assumed by a subordinate ruler in the empire.

The word *yavuga* is equated with the term *hsi-hou* (*yabgu*) occurring in *Ch'ien Han-shu* and the *Hou Han-shu* in connection with the history of the Yüeh-chih.[37] The expression *yavuga* may have been derived from *yam*—(to 'lead') with —*v*— from -*m* and regular suffix -*uka* to be set beside Parthian *ymg*, **yamay* and Persian *Ẓmyg*, **zmīy*, meaning "leader".[38] The word *yavuga* can also be explained as connected with an Iranian *yavuka* or *yāvuka*, "gatherer or assembler of a troop, troop-leader," etc. The term concerned may be taken as derived from the base *yau*, which also yielded Old Iranian *yūtha*, "group".[39]

So *yavuga* was not essentially a royal title. It could have been used by a subordinate ruler, as also suggested by an epigraph of the year 126 of the Azes Era (i.e. A.D. 68-69).[40]

Most of the graffiti are scribblings. They generally do not record any well considered and/or executed action. They mainly record the names of visitors to the spots concerned or of those whose names the former wanted to inscribe, and occasionally they refer to the ruling king or date or both. But in doing so they may unknowingly include the localities concerned with the territory of the ruler(s) mentioned by them.

At least they indicate the plausibility of the inclusion of the areas of Alam Bridge and Hunza within the Kushāṇa empire. These could well have been in Chi-pin conquered by Kujula Kadphises.[41] A male figure in well-known Yüeh-chih dress engraved near an inscription allegedly referring to V'ima (HK1) on the Hunza rock (no. 1) may suggest *inter alia* the familiarity of the artists concerned with the appearance of the Yüeh-chih royal personage.[42] Thus the graffiti concerned alludes to Kushāṇa rule in a portion of the upper region of modern Kashmir. Herein lies the importance of the documents concerned.

NOTES

[1]For the correct spelling (*Kharoshṭī* and not *Khareshthī*) of the name of the script concerned, see B. N. Mukherjee, "A Note on the Name Kharoshṭhī", *Journal of the Asiatic Society*, 1981, Vol. XXIII, p. 144f.
[2]G. Fussman, "Inscriptions de Gilgit", *Bulletin de l' Ecole Francaise d' Extrême-Orient*, Paris, 1978, Vol. LXV, p. 9.
[3]*Ibid.*, p. 20.
[4]*Ibid.*, p. 26.
[5]*Ibid.*, p. 20.
[6]*Ibid.*, p. 23.
[7]*Ibid.*, pl. XIII, nos. 20-21.
[8]*Ibid.*, p. 26.
[9]*Ibid.*, pl. XV, no. 24. For Fussman's reading see *Ibid.*, pp. 28-29.
[10]*Ibid.*, p. 24.
[11]*Ibid.*, pl. XV, no. 24.
[12]For Fussman's reading, see *Ibid.*, p. 30.
[13]A. H. Dani, *Chilas, The City of Nanga Parvat* (*Dyamar*), Islamabad, 1983, pp. 66-67.
[14]*Ibid.*, p. 114.
[15]*Ibid.*, pl. no. 89 on p. 113.
[16]A. H. Dani, "The Sacred Rock of Hunza", *Journal of Central Asia*, Islamabad, 1985, Vol. VIII, no. 2, p. 9.
[17]*Ibid.*, p. 27.
[18]B. N. Mukherjee, *The Kushāṇa Genealogy*, Calcutta, 1967, pp. 45 and 47.
[19]*CAJ*, Vol. VIII, no. 2, 1985, p. 25.

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[20] *British Museum Quarterly*, Vol. XXVIII, 1964, pp. 44-45.
[21] *CAJ*, Vol. VIII, no. 2, 1985, p. 33.
[22] *CAJ*, Vol. VIII, no. 2, 1985, pp. 24-25.
[23] *Ibid.*, p. 27.
[24] *Ibid.*, pl. 25.
[25] *Ibid.*, pl. 26-27.
[26] *Ibid.*, p. 26.
[27] *Ibid.*, p. 30.
[28] *Ibid.*, p. 34.
[29] *Ibid.*, p. 30.
[30] *Ibid.*, p. 68.
[30a] *Ibid.*, p. 31.
[31] *Ibid.*, p. 33.
[32] *Ibid.*, pp. 25-26.
[33] *Ibid.*, p. 32.
[34] *Ibid.*, p. 30.
[34a] *Ibid.*, p. 28.
[35] For a full discussion on Kushāṇa administration, see the Epilogue of our work *The Rise and Fall of the Kushāṇa Empire*, Calcutta 1968.
[36] R. B. Whitehead, *Catalogue of the Coins in the Punjab Museum*, Lahore, Vol. I, Oxford, 1914, p. 179.
[37] *Ch'ian Han-shu* (T'ung-wen shu-chü edition), ch. 96A, p. 14b; *Hou Han-shu* (Ssu-pu pei-yao edition), ch. 118, p. 9a.
[38] K. Hoffman, and others (editors), *Handbuch der Orientalistik*, vol. IV, Iranistik, pt. I, *Linguistik*, p. 136.
[39] *Journal of the Royal Asiatic Society of Great Britain and Ireland*, 1972, p. 107.
[40] *Bulletin de l' École Francaise de' Extreme-Orient*, 1985, Vol. LXXIV, p. 48. The date of the record is the year 126 (and not 26) of the Azes Era (see *Ibid.*, pl. XI).
[41] *HHS*, ch. 118, p. 9a. For the identification of Chi-pin, see B. N. Mukherjee, *An Agrippan Source—A Study in Indo-Parthian History*, Calcutta, 1970, pp. 192-193.
[42] A. H. Dani, *Human Records on Karakoram Highway*, Islamabad, 1983, p. 82, *CAJ*, Vol. VIII, no. 2, 1983, pl. I and 25.

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AN IMAGE OF MAITREYA OF THE YEAR 110

B. N. MUKHERJEE

AN inscription in Kharoshṭī characters is noticeable on the halo of a standing icon of the Buddhist deity Maitreya belonging to the Gandhāra school of art. A reproduction of the image appeared some time back in a sale catalogue. My attention to it was drawn by Mrs. Carolyn Schmidt of Columbus (Ohio, U.S.A.). She also kindly gave me good photographs of the reproduction (fig. 1).

The inscription on the halo of the icon can be read and translated as follows (figs. 2-5):—

TEXT

L 1A (to the right or proper left of the head) (to be read from outside) *Dasha śaemi* (*mi* engraved upside down)

L 1B (to the left or proper right of the head) (to be read from outside) *Dasha sese śatimi*

L 2 *iha Takshaśi* [*la*]*e taḍadhaḍhe nasina Aje* (or *Ajo*) *aga Maharaja Rajadirajasa dia Matrasa*

TRANSLATION

L 1A In the [year] hundred (and) ten
L 1B at the end of [the year] ten [and] hundred (i.e. at the end of the 110th year)
L 2 Here in Takshaśilā at that thought of (i.e. pre-determined) time (*tadaḍhaḍhe*<*tadādhyāte*) by applying (*nasina*<*nyāsena*) [the reckoning] of the Great King, King of Kings Aja of anterior time the gift (*dia*<*deya*) [of the image] of Maitreya (⩽*Matra*) [is given].

COMMENTS

Two lines in the inscription are concerned with date. Line 1A clearly indicates the date as "in the (year) one hundred ten" (since the expression concerned cannot be conceivably interpreted as denoting "in the year ten hundredth"). The year concerned may have been a current one or an expired one. The latter alternative is confirmed by line 1B. Perhaps for clearly pointing out the date as an expired year it was written for the second

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Fig. 1

Fig. 2

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Fig. 3

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Fig. 4

Fig. 5

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time after finding out the fault in line 1A, where one letter (*mi*) was also wrongly engraved. So the date of the image is the year 110 (expired).

The year 110 is referred to the era of the Great King, King of Kings Aja or Azes of anterior time. This reckoning can now be easily recognised as the Era of Azes I, identifiable with the era of 58 B.C. (see B. N. Mukherjee, "An Interesting Kharoshṭī Inscription", *Journal of Ancient Indian History*, vol. XI, 1977-78, pp. 93f). Hence the expired year 110 corresponded to *c.* A.D. 52-53.

This inscribed piece seems to be the seventh known dated icon of the Gandhāra school of art and its first known image dated in a specified era. The sculpture is also the first noticed representation of Maitreya bearing an inscription referring to the deity by name.

The existence of the image of Maitreya in A.D. 52 strongly suggests the creation of the first icon of the Buddha before or by that date.

All these considerations indicate the importance of the inscribed icon. It is indeed an outstanding piece of sculpture.

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A MATHURA IMAGE INSCRIPTION

B. N. MUKHERJEE

THERE is an interesting sculpture (no. 138654) in the collection of the Asian Art Museum in San Francisco. The authorities of the Museum have kindly permitted me to publish it. I am greatful to Mrs. Terese Tse Bartholomew of the Museum for obtaining the permission on my behalf.

The sculpture represents a male divinity standing to front under a hood formed by several snakes. His left hand holds the handle of a *kamaṇḍalu*, whereas the half raised right hand is in *abhaya-mudrā*. Stylistically the sculpture, made of well-known red sand stone with cream spots, belongs to the school of Mathura of the Kushāṇa age (fig. 1).

On the pedestal of the image appears a Brahmi inscription in four lines. Palaeographically it is datable to the Kushāṇa age. The record is written in the well-known "mixed dialeet". Here we can notice Prakrit influenced by Sanskrit (fig. 2).

The epigraph is fragmentary. So we cannot have the full text. The readable portion can be read and translated as follows:

TEXT

L1 ....*(ti) rājasya (De)vaputrasya (Shā)hi*
V(v)āsudevasya rājya (sam)vatsara 100[+] 70

L2 *Hima (pakshe) (di)tiye* 2 *divasa trī (tiye) etasya*....
....*vaṇi Āryya*

L3 *(Cha)krasya pratimā pratishṭhāpitā*
Maha (di)tasa Sakasya [suta]sya
Tajahamara....

L4 .....*praṇayāyi*.....

TRANSLATION

On the third day of the second-2-fortnight of the winter (season) of the regnal year 100(+)70 of Rājādhirāja Devaputra Shāhi V(v)āsudeva; on this (date) the image of noble Chakra is established [by] Tajahamara, the son of Saka Mahadita.....

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Fig. 1

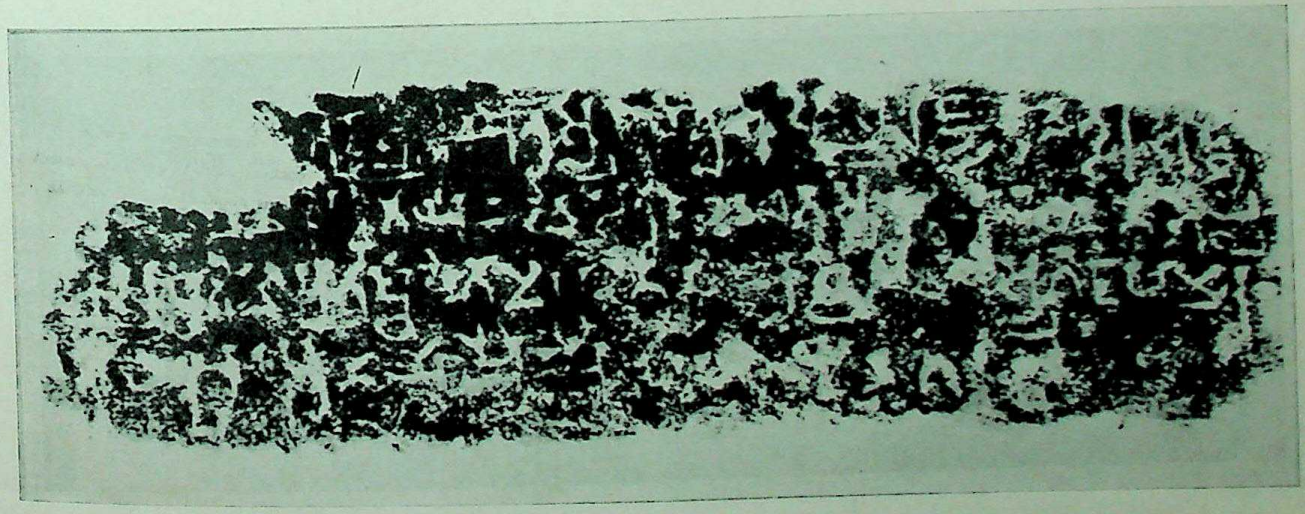

Fig. 2

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It appears that one Tajahamara, the son of Mahadita or Mahāditya established an image of Chakra or Nāga at a place which can be taken as Madhuvana (i.e. Mathurā), if we read *Madhuvane* for . . . *vaṇi* in line 2. Madhāditya and so also his son Tajahamara were ethnically affiliated to the Śakas. The presence of the Śakas in Mathurā in the early centuries of the Christian Era is known from various sources.[1]

The ruler, during whose reign the image was installed, was V(v)āsudeva. Since the record must be palaeographically assigned to the Kushāṇa age and the image concerned belongs to the Mathura school of art, there is no doubt that V(v)āsudeva with the epithet *Devaputra* must have been a Kushāṇa monarch. Hence the name, written as *V(v)āsudeva*, can be easily identified with that of Vāsudeva. There were at least two Kushāṇa emperors of that name. On the other hand, there is no evidence of the historicity of a Kushāṇa king with the name spelt correctly as *V(v)āsudeva*. Moreover, the names of the Kushāṇa rulers are known to have been spelt wrongly in several epigraphs.[2]

The year 170 cannot be literally taken to be a "regnal year" of some ruler, since 170 years will be too long a period for a person to rule physically. Moreover, the date referring to one of the two Kushāṇa kings called Vāsudeva, both of whom ruled after Kanishka I, must be logically referred to the Kanishka Era. In each of the two Mathura inscriptions of the Kushāṇa king Vāsishka the year of the Kanishka Era is indeed mentioned as rājya-samvatsara[3]. Hence the year 170 can be attributed to that reckoning.

This date proves the continuity of the Kanishka Era in its second century and suggests that the king in question should have been the second and not the first Kushāṇa king of that name. Vāsudeva I is known to have ruled from the year 64 or 67 to the year 98 of the Kanishka Era, and so in a period much earlier than the year 170. The epigraph in question is the first known inscription of Vāsudeva II, the last known Kushāṇa emperor.[4] His rule has so far been indicated by coins and Chinese and Armenian literature.[5]

Since the greater part of the Kushāṇa empire was annexed to the Sasanid empire by *c.* A.D. 262, Vāsudeva II, who ruled over the western as well as the eastern part of the empire,[6] and who had been on the throne in *c.* A.D. 230,[7] might well have ended his reign by that date (A.D. 262). Hence the year 170 of the Kanishka Era should be placed in or before *c.* A.D. 262. This means that the year of this reckoning cannot be placed after (*c.* A.D. 262-170=) *c.* A.D. 92.

This inference supports strongly the theory advocating the identification of the Kanishka Era with the Śaka Era of A.D. 78. At least there is now no doubt that the great Kushāṇa king Kanishka I ruled in the last quarter of the 1st century A.D.

NOTES

[1]B. N. Mukherjee, *Mathurā and its Society—The Śaka-Pahlava Phase*, Calcutta, 1981, pp. 112f.
[2]H. Lüders, *Mathurā Inscriptions* (edited by K. L. Jannert), Göttingen, 1961, pp. 44, 46, 126, 172 etc. In an inscription of the year 24 the name of Vāsishka is spelt as *V(v)āsiska* (*ibid*, *p.* 126).
[3]*Ibid.*, pp. 63 and 126.
[4]B. N. Mukherjee, *The Rise and Fall of the Kushāṇa Empire*, Calcutta, 1988, pp. 180f.
[5]*Ibid.*, pp. 180f and 230-31.
[6]*Ibid.*, p. 236.
[7]*Ibid.*, p. 230.

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ROLE OF EPIGRAPHY IN ORIENTAL STUDIES

KUNJA GOBINDA GOSWAMI

IT was a red letter day for Indian Epigraphy when James Prinsep was successful in 1837 after enormous labour to read two syllables *dēnam* in a good number of small Brāhmī inscriptions on the stone railings of Sanchi Buddhist Stūpa. James Prinsep (born in 1799) was the son of John Prinsep who was an important officer of the East India Company. One of James' elder brothers was a member of the Governor General's Council and Vice President of the Asiatic Society (of Bengal). James Prinsep came to India with a small job in the Calcutta Mint and by virtue of his competence rose to the post of Assay Master there. Then he began to take interest in the affairs of the Asiatic Society and gradually rose to the post of the Secretary of the Society. At this time he applied his energy to the decipherment of the Brāhmī script of the Votive inscriptions of Sanchi railings. Finding that exactly same two syllables occur at the end of some inscriptions he thought that they might form part of some eulogy to the dead persons or dedication or gift by certain devotees as mentioned in Buddhist scriptures or seen in Buddhist temples. Consequently he started with the supposition taking them as "dānaṃ", the letters being d (द) with long a (आ) and n (न) and anusvāra. With the help of these letters applied in other places he gradually added on more and more letters to his deciphered list and ultimately succeeded to decipher almost the whole list of Brāhmī alphabet. Then he proved the correctness of his readings by applying them to the inscription of Asoka in Delhi Pillar. On the other hand almost simultaneously Professor Lassen of Sanskrit Department of Bonn University of Germany tried to decipher the Brāhmī alphabet with the help of two Indo-Greek coins, one of King Agathokles and the other of King Pantaleon in bilingual Greek and Brāhmī Scripts. But the Greek names changed into Indian language in Brāhmī as Agathuklaya and Paṃtaleva raised doubt in his mind as to the correctness of his reading. But ultimately it was found that his reading was quite correct. But he could not proceed further for want of materials. On the other hand Prinsep had sufficient materials at his disposal and could successfully decipher the whole lot of Brāhmī alphabet. Thereafter he began to decipher the Kharoṣṭhi script. But excessive labour seriously told upon his health and he breathed his last at a comparatively young age before completing the decipherment of Kharoṣṭhi alphabet.

In the 19th century A.D. three great persons who brought about a revolution in the sphere of decipherment of scripts of the ancient world are—

(1) Champollion, who deciphered the rosetta stone inscription written in Egyptian Hieroglyphics.

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(2) Rowlinson who deciphered the Behistun stone inscription of King Derius written in Ancient Babylonian cuniform character.
(3) And the third is James Prinsep decipherer of Brāhmī and partly of Kharoṣṭhi scripts of India.

These names will go down to posterity for outstanding and extra-ordinary contribution to human knowledge.

I think on our part we should do something to perpetuate the memory of James Prinsep here as he dedicated his life to decipher all the Brāhmī letters and some Kharoṣṭhi also as a member of the Asiatic Society.

After the decipherment of Brāhmī and Kharoṣṭhi scripts enormous materials in the shape of inscriptions on stone, gold, silver, copper, iron, terracotta, bricks etc. have bring discovered and are been discovered frequently. The acquisition is now so vast that they form a separate remarkable section of Sanskrit and Prakrit literature under the jurisdiction of Indian Epigraphy.

(*a*) Asoka's inscriptions edited by Cunningham and revised by Hultzsch, (*b*) Kharoṣṭhi inscriptions by Stenkonow and (*c*) Corpus Inscriptionum Indicarum by Fleet are some of the outstanding works of Epigraphic literature.

There are inscriptions of various nature *viz.*, literary, historical, geographical, social and religious etc.

Literary

So far as literary matters are concerned we are getting a good number of inscriptions both Sanskrit and Prakrit through the volumes of Epigraphical works, published by the Government of India and some other organisations. Epigraphic literature has now become a very important subject for study from literary point of view. Among others the *Allahabad Praśasti* of emperor Samudra Gupta written by his minister *Hari ṣeṇa* is really an outstanding piece of poetic work. Written in the form of a *campu* Kāvya its verses are excellent and the prose is elegant. Hariṣeṇa himself calls his composition as *Kāvyam*. The Mandasore stone inscription mentioning Kumāra Gupta (I) and Bandhu-Varman, is also a good piece of poetic work. The poet is Vatsabhaṭṭi who did his work carefully and with effort (Prayatena). It appears that at places he tried to imitate the style of the *Meghadūtam* of Kālidāsa but it was a poor imitation. Mandasore stone pillar inscription of Yaśodharman (6th century A.D.) composed by poet Vāsula is also really good. The Ihole inscription of Poet Ravikīrti of the time of Pulakeśi (II) (7th century A.D.) is also remarkable. The poet claims reputation like that of Kālidāsa and Bhāravi (Kālidāsa-Bhāravi Kīrtiḥ).

One of the other great poetic works, the *Bhuvaneśvara* inscription of poet *Vācaspati* on Bhaṭṭabhavadeva is a *praśasti* (eulogy) of Bhavadeva's family and himself. Bhaṭṭabhavadeva was a great scholar and able minister of King Harivarman of Bengal (11th century A.D.). The other great scholar of Bengal who wrote an inscription found at Deopara in Rajshahi district of present Bangladesh was poet *Umāpatidhara*, one of the court poets of King Lakṣmaṇasena (11th century A.D.) (Vācahpallavayatyumāpatidharaḥ) (Gītagovindam). Similarly there are other great poets in the field of Epigraphy.

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Historical

So far as historical matters are concerned epigraphy has brought about a revolution in the field of ancient Indian history. Epigraphy is constantly supplying new materials for reconstructing our ancient history. Most of the chapters of our ancient period are being constantly revised in the light of the newly discovered inscriptions.

A startling fact that is the infamous reign of Rāmagupta, the elder brother of Chandragupta II has been hinted in the Sanjan plates of Amoghabarsha I (*E.I.* XVIII, P. 248) (*Hatvā bhrātarameva rājyam aharad devim ca dīnastathā Guptānvayaḥ*) and also in the cambay Plate of Govinda IV (*E.I.* VII, P. 86) (*Sāmarthye Sati ninditā pravihitā naivāgraje Krūratā*). These events are mentioned in the drama *Devī Candragupta* also, which says that Candra Gupta captured the throne and the queen by killing his ignoble ruling elder brother Rāma Gupta.

Geographical

From the *Mahasthan* inscription of about the Maurya period we get the name *Puḍanagala* (Puṇḍranagara) ancient name of Mahāsthāna of Bagura district of Bangladesh. Similarly, *Ghoṣitārāma* monastery in Kausambi (near Allahabad) and *Raktamṛttikā-vihāra* in Murshidabad district of West Bengal have been identified with the help of the writings on the terracotta sealings found in those places.

Social

In ancient India profession was taken to be the criterion of the social status of a person. In the Talgunda inscriptions of Śāntivarman (455-70 A.D.). We find that the first King of the Kadamba dynasty originally Brahmin by caste was Mayūraśarman, but the later kings had to surrender their surname *Śarman* and became *Varman* a term used by Kṣatriyas after taking the ruling profession. Another social custom not found elsewhere in India except South India *i.e.*, the marriage of a boy with the daughter of his maternal uncle is mentioned in the Cambay place of Govinda IV (*E.I.* VII 6) where it is stated that Jagat tunga, son of king Amoghavarsa of the Rāṣṭrakuṭa family married Lakṣmī the daughter of his maternal uncle Ranavigraha. This is supported by the Smṛti book of Bodhāyana who mentions that in South India one may marry his maternal uncle's daughter ("daḳṣināpathe-mātulakanyā bivāhaḥ). This practice of South India is disclosed by the above epigraphic record. In the *Śrīmad Bhāgavata* also at places we find mention of such relationship.

Economical

Economic condition of the country is also known from some of the inscriptions of the so far discovered coins in India. The earliest are taken to be the punch marked silver and copper coins known as *puraṇa* and *dharaṇa* etc. During the Gupta administration gold and silver coins with the figures of deities, kings, queens and animals specially sacrificial horse etc. and legend in Sanskrit are found indicating that the country was economically sound. During the Gupta period we find mention also of a gold coin called *dīnāra* apparently under the influence of the Roman coin denarious. In Bengal the gold coin dināra was apparently a legal tender during the Gupta period as we find in connection with transfer of land in a number of inscriptions. Similarly *dramma* was the legal tender during the reign of King Dharmapala, as we are told by his Mahabodhi inscription (*Gauḍa Lekhamālā*, p. 31) that a deep lake was excavated by him for the benefit of good people at a cost of three thousand *Drammas* (*Tritayena* sahasrena drammānam Khānitā).

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Dramma is supposed to be equivalent to be a Rupee. From the inscription of Bengal of the Sena Kings we learn that Cowrhi (*Kapardaka purana*) was the legal tender of their time.

Political

According to most of the inscriptions kingship was heriditary and ministry and other administrative posts were also generally heriditary (*anvaya-prāptasācivya*).

As regards foreign relation, we learn from Asoka's inscriptions that he (King Asoka) had deplomatic relation with the great king Antiochos Theos of Syria and some other contemporary ruler's of different countries.

Similarly some hint of Samudragupta's foreign relation with Singhala (mod. Sri Lanka) and some other countries has been indicated in his Allahabad inscription. Nalanda inscription of King Devapala (*E.I.* XVII) informs us that he had friendly foreign relation with King Bālaputra deva, ruler of Suvarna dvipa at whose request the former granted five villages in Bihar for meeting the recurring expenses of a monastery built by Balaputradeva at Nalanda.

Religious

As regards religious information inscriptions are our very important guide. From the Rummindei inscription we know that King Asoka made Lumbini grāma the birth place of Buddha a centre for pilgrimage and granted some concession for the visitors. Then we come to the Besnagar (Dt. Bhilsa) inscription (circa 2nd century B.C.) of Heleodoros, the Greek ambassador, which gives the startling information that Heleodoros became a Bhāgavata. He was converted to the cult of Bhagavat or Viṣṇu and erected a Garuḍadhavaja in honour of god Vāsudeva. Thereafter from the Hati-gumpha (Bhuvanesvar) inscription we learn that King Kharavela was a Jaina by faith. Similarly the Gupta Kings were devotees of Viṣṇu (Paramabhāgavata). Likewise the dynasty of the Pala Kings of Bengal so long was regarded as devoted to Buddhism only but a stone inscription recently discovered at Bangarh (District West Dinajpur, West Bengal) gives the sensational information that King Naya Pala (1027-43 A.D.) son of King Mahipala was the disciple of the Saint Sarva Śiva of the Śaiva line descended from the irascible Sage Durvāsas (*Vide* Balurghat College Museum Memoir 1975, Page 4 f by Prof. Achintya Krishna Goswami and also *Silālekha Tāmraśāsanādir Prasanga,* 1982, by Dr. D. C. Sircar page 85 f). King Mahipala was also a patron of Śaivism according to the same inscription.

There are many other instances which are available from inscriptions throwing sufficient light on the hitherto unknown different phases of the past history of our country.

In this connection it may be mentioned that it is highly gratifying to know that Prof. B. N. Mukherjee has been able to dicipher an inscription in Shell script in the Lucknow Museum. If he can dicipher the whole list of this alphabet with the help of similar other inscriptions it will be really a great achievement and remarkable success. We are now waiting for a universally accepted reading of the Indus script. This is expected to throw a flood of light on the untold chapter of our earliest superb civilization.

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NEW DISCOVERIES IN KUSHĀNA ART AND CONTRIBUTION OF MATHURĀ ART IN THE GROWTH OF THE ART IN THE OXUS REGION*

R. C. SHARMA

THE Kushāna period was responsible for weaving a thread of cultural harmony and exchange of artistic traits between several countries including India and Soviet Russia in the early centuries of the Christian era. Paradoxically, the age continues to be haunted by different knotty problems of chronology, iconography, and style despite a large number of antiquarian remains brought to light from various parts of its vast empire. Probably no dynasty or period has left such an abundant material culture as the Kushāna age. The important museums, art galleries and individual collections do possess at least some representative Kushāna specimens. The process of reappearance of discovery of the archaeological wealth which commenced in the first half of the last century remains uninterrupted till date, sometimes with startling finds. More we get more perplexed we feel and the joy of possession is soon turned into the realisation of our responsibility in finding out a due solution of the problems which a fresh hoard contributes.

The new discoveries of the Kushāna period are of considerable significance. These have emerged from the distant quarters of the Kushāna realm and belong to different art schools or their substyles flourishing during the period. Some have been reported well but others are casually referred to or are in process of study and examination. For lack of proper communication owing to various factors and particularly the language barrier, even the reported discoveries have not been fully appreciated by all Kushanologists working in different fields. This paper aims at highlighting mainly—those recent discoveries with which the author has directly or indirectly remained associated in one way or the other.

Sonkh: The site is situated about 22 km. to north west of Mathurā and was excavated by Dr. Herbert Haertel[1] the then Director of the Indian Art Museum, Berlin and Professor in the Free University. The work which commenced in 1966 was wound up in 1974. The excavated material was made over to the Mathurā Museum when the present author was its Curator in 1974 but a few specimens were allowed to be taken

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away to Berlin with the excavators. While a detailed report is awaited, the salient features of the expedition have been reported in some journals and a research paper which was also published as a small monograph. The excavators preferred comparatively an intact and undisturbed site and Sonkh[2] looked quite imposing. The extensive ancient habitational area was converted into a fortress by a Jat Chief Hati Singh who was a contemporary of Sūraj Mal and Jawāhar Singh of the then Bharatpur State in the 18th century.The forty successive layers from top to bottom revealed the remains from the 19th century to the Painted Grey and Black and Red Ware level assigned to c. 8th century B.C.

The present paper being confined to the Kushāna period only, we are concerned with the layers from No. 16 and 22 which exposed some brick pavements and structures. These were the dwellings with small rooms built of almost uniform large sized bricks measuring $36 \times 26 \times 6$ cms. An apsidal shrine also came to light and the position of its walls indicates that it was begun in the early Kushāna era and rebuilt in the third century A.D. It was provided with a pathway for circumambulation. Interestingly enough a stone stele carved with a seated mother goddess (Mātrikā) was found from the shrine. The importance lies in the fact that it is the earliest reminiscent of a Hindu temple.

The period of these structures has been fixed on the basis of positive evidence. The copper coins from the reign of Vāsudeva I to Kanishka III found from the same layers, help us to assign the time limit of this Kushāna settlement from late 2nd century A.D. to the 3rd century.[3] This may, however, be made clear that the excavators of Sonkh reached the following conclusion in framing the chronology of the Kushāna age:

'Notwithstanding theory one may follow in dating Kanishka I, after Sonkh there is no justification of placing him in the second or even in the 3rd century A.D'.[4]

The statuettes of Vishṇu, Skanda, Kubera, Mahishāsuramardinī, Durgā and mother goddesses have been recovered from the Kushāna layers. A few bronze objects[5] further enhance the magnitude of Sonkh excavation. One plaque is almost square and depicts a divine couple, the male with a bowl in his left hand and his lion or cat headed spouse holds a child to her left side. The right hands of both of these deities are raised in the protection pose. The other small and vertical plaque represents the young Kārttikeya holding a long spear. A cup with lid was also unearthed from the Kushāna layers.

The literary traditions do tell us that when Mahmūd Ghaznavi invaded over Mathurā he took away several gold and silver statues. But an archaeological evidence to corroborate this tradition remained wanting till the discovery of the above cited bronze objects.

The most thrilling contribution of the Sonkh excavation for Kushāna period was the discovery of the plan of another apsidal temple and the fragments of its richly carved railing and gateway. The shrine was built half a km. to the north of the main excavation site. The indication of its existence was given by the bricks being carried away by the villagers and a stone tympanum carved on both sides with a human faced Garuḍa quelling a three headed cobra. A similar piece saw its way to the Mathurā Museum and this hailed from Jogipurā a neighbouring hamlet of Sonkh. The sculpture showed a human form of Garuḍa climbing a hillock.

Encouraged by these casual finds and also by the existence of a large size Nāga deity

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of the Kushāna period, still in worship on the spot as Chāmardevī the excavators laid a trench which met with a great success.

The early phase of the exposed plan of the apsidal shrine belongs to the pre-Kushāna period and has the same type of baked mud bricks measuring 42×48 cms. as seen in Sūryamitra levels (c. 1st century B.C.) at the main excavation site which also revealed some Mitra and Datta coins.[6] The second phase which stood on the foundations of the earlier one and distinguished by the remains of fifteen round brick pillars was built by 100 A.D., *i.e.*, the Kanishka's reign.[7]

The architectural parts chiselled out of the typical red sand stone with insignificant buff dots, used by the Mathurā sculptor, are some of the rare spacimens of Mathurā School. A lintel which probably represents the court of a Nāga king seated majestically with a canopy of a seven hooded cobra on a throne. He fastens a long turban presented by a group of people including some children who visited the King's court. A lady with an equal number of snake hoods over her head sits to the right side of the king with same royal grace. Stretching her right arm she accepts a gift of a necklace which has been presented by the visiting delegation through a young lady wearing a single hooded snake scalp. The attendants to the left of the king also have a snake crest. While Dr. Haertel identifies it as the representation of the Nāgarāja Vāsuki and his sister Jaratkāru the present author is inclined to interpret it as a coronation scene.[8]

A bracket figure joining the lintel with the doorjamb has been shaped as a beautiful young damsel—Śālabhanjikā—bearing the branch of the tree with right hand and the left arm held akimbo. Her anklets show the snake hood as cognizance of her association with the Nāga family.[9] There are some balustrades which also bear the serpent figures. A canopy shows a Nāga nobleman coming out of the wide open jaws of a fish tailed crocodile and it may be indicative of some critical moments through which the Nāga dynasty passed. Another coping is carved with a fish-tailed elephant (Jalebha) with two stalked lotuses in his half upraised trunk. This affirms a happy and welcome gesture.

Although Mathurā region was the stronghold of Buddhism the excavation at Sonkh does not confirm its prevalence in this part. One is inclined to conclude that the Buddhism was confined to the urban centres and the country side continued to stick to the original faith which bore the stamp of Hinduism as testified by the discovery of several Brāhmanical deities. The worship of Nāgas, Skanda and Mahishāsuramardinī seems to have been very popular and this represents a folk tendency of Hinduism or Brāhmanism.

Immediately after the closure of the Sonkh expedition the excavation work at Mathurā was taken up by Shri M. C. Joshi of the Archaeological Survey of India.[10] The sequence of culture is divided into five periods and the fourth period is associated with the Kushānas. It is distinguished by sprinklers, stamped pots incense burners, jars and pots with handles. The terracotta items include moulded face and hand made body, glazed items, Nāgas, Yakshas, Vāmanakas and Mother and Child. A Kushāna period tank made of burnt bricks was exposed at the famous site of Kanālī. A stone inscription records the date as 5th regnal year of Kanishka.[11]

Govindnagar: The largest number of Kushāna sculptures during the recent years was unearthed from the site of Govindnagar in the Western outskirts of Mathurā city.[12]

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When the present author joined as Curator of Mathurā Museum in 1969 the spot looked an impressive, intact and potential site. The efforts to declare it as a protected archaeological site and to start excavations did not bear fruits but the local Housing Society began to level up the mound in 1976. Consequently some sculptures appeared and the Museum also pitched a tent for salvaging the antiquarian remains. Within a month hundreds of sculptural fragments were collected and most of them belong to the Kushāna period others range between the 1st century B.C. and the 6th century A.D. The monastery which stood in the Kushāna and Gupta periods has been recorded in one of the inscriptions of the years 121 and 15 as VĪRADATTA VIHĀRA.[13] Some terracotta figurines can of course be assigned to the pre-Mauryan age. The Kushāna period terracotta items include dabbers for shaping the pots, horse, toycarts, crocodile jaw and bricks with lotus decoration or bearing the battlement motif Kapiśīrsaka.[14]

The notable sculptural finds include the architectural fragments, parasols, haloes, Buddhist icons and a few Brāhmanical deities. The earliest dated sculpture is a fragmentary pillar which records the 12th sequal year of Kanishka (90 A.D.)[15] and the latest dated find belongs to the year 161 of the Gupta era (480 A.D.).[16]

The railpost which on the stylistic ground should be assigned to the pre-Kushāna period (Mathurā Museum No. 76.40) measures 139 cms. in the height. It consists of four square compartment one over the other on both sides. The better preserved side in the top compartment represents the turban of Bodhisattva flanked by two flywhisk bearing attendants. The remaining three compartments depict the episode of sage Ekaśringa.[17] The other pillar (Mathurā Museum No. 76.39) measuring 108 cms. shows a lady seated on a cushioned wicker seat and applying some cosmetics on her face or looking at the nail marks.[18] The other railposts (No. 76.37) represent the noblemen carrying garlands.[19]

The crossbars depict a variety of full blown lotuses and the copings are carved with ogee arch, symbols and devotees. Among the door jambs one is richly decorated (76.41) with grape creeper issuing from the mouth of the half kenlt dwarf.[20] In carving the attendants the sculptor seems to have erred as the man with scythian dress is seen bare footed while the native person wears the shoes.

The parasols or umbrellas which protected the underinstalled image from sun and rain have been discovered in different sites. A huge parasol (dia. 208 cms.) of which about two-third exists depicts different auspicious motifs (No. 72.5).[21] Another umbrella, smaller in dimension (No. 75.32) is carved with Mangalakalaśa (full vase), Svastika (mystic cross), Triratna (three jewels), Śankha (conch), Pushpadāmā (basket with rosary), Phalapātra or Ratnapātra (basket with fruits or jewels), Śrīvatsa (central jewel) and Nidhipātra (pot oozing wealth).

The site has revealed a good number of haloes (Prabhāmaṇḍalas). The earlier ones are plain with a scalloped border and a beaded string in the early phase but in the later period full blown lotus becomes conspicuous. In the post Kushāna span several decorated bands occur. The lion throne of the Kushāna period (76.167) is a rare find. It is supported on four pillars and the side frames are carved with lions in all directions.[22]

The Buddhist statues discovered from the site frame an interesting chronology of the development of the Buddha image from symbol to model type. The first statue

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unearthed even before the levelling of the mound is almost a life size standing Buddha image (71.105) with a large scalloped halo and shaven head with a snail knot (Kaparda). This belongs to the early tradition of Kanishka phase.[23] The impact of Gandhāra with rib or shutter type drapery and its receding stage in the late or post Kushāna period is noticed on several icons. Some of them are inscribed and furnish useful information. The Govindnagar Buddha statues hint that the Sārnāth style of the Gupta age had its origin at Mathurā in the post-Kushāna period.[24]

An outstanding discovery from this site is the pedestal of the Amitābha Buddha (No. 77.30) inscribed in the year 26 (104 A.D.). Before the estimation of this antiquity the cult of Amitābha was supposed to have its origin outside India. Thus this inscribed and dated document opens a new chapter in the development of the Buddhist pantheon. Curiously enough, the lotus (cognizance of Amitābha) is carved in the background of the left foot of the deity.[25]

A hoard of 1,543 copper coins was also unearthed from the spot and it contained 768 late Kushāna specimens. King at altar and Śiva with bull form the majority. The imperial Kushāna coinage is, however, missing.[27]

Hulāskherā: Another site of considerable importance is Hulāshkerā near Mohanlālganj in Lucknow District.[28] While the cultural sequence is spread over from about 7th century B.C. to the 7th-8th century A.D. its Kushāna phase is remarkable for more than one reasons. This extensive mound has brought to light an impressive road (Rājpath) of the Kushāna period measuring 9.80 meters in width made of double box. The bricks used in this road are of three different sizes *viz.*, $39 \times 23 \times 6{\cdot}5$, $39 \times 22 \times 6$ and $35 \times 22 \times 5$ cms. The pottery includes inturned bowls, inkpot type lids and storage jars. The most significant find is a gold plaque measuring $3{\cdot}8 \times 2{\cdot}3$ cms. representing Kārttikeya holding a spear. He wears a fluted crown, ear rings, necklace and *dhotī*. The figure must be dated to the early Kushāna period c. 1st century A.D.[29] The site seems to have been a large fort which was in habitation in the Kushāna and Gupta periods.

Sanghol: One of the most important and epoch making recent archaeological discoveries is the hoard of Kushāna sculptures from Sanghol in Ludhiana District of Punjab.[30] The site has been revealing the antiquarian remains from the Harappan Culture to the late Gupta period but before 1985 it was not realised that the land conceals in its womb a magnificent *stūpa* of the Kushāna period studded with some of the finest jewels of Indian art. Fabricated in the typical spotted red sand stone, this lucky discovery further corroborates the potential and prolific nature of Mathurā school of art. This is the biggest repository of Mathurā ateliers of art outside Mathurā region.

Of the 117 sculptures 4 are corner pillars, 58 upright pillars or railposts, 35 cross bars and 13 copings.[31] The railposts representing damsels (Yakshīs) in different actions and inviting gestures immediately catch our attention. Wearing large ear rings, torque, bangles, armlets, girdle, with several strings and anklets, these female figures with voluptuous bosoms and heavy hips are often seen majestically mounting over the kneeling dwarf who often seems to enjoy her kicks. The lady sucking the last drop, another climbing up with a child one riding on a knelt Yaksha and another fondling a child with her upraised arms, are some of the unique poses and actions which were hitherto unnoticed in the Mathurā studio.

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India and Oxus region

The study of contacts between India and Oxus region has not been fully made. The scholars have generally confined to trace impact of Gandhāra over Mathurā and vice versa and this itself gives a good scope for further researches in the complicated issues. Like the word Yavana, Gandhara has also been used rather vaguely. All foreign invaders in India were called as Yavanas although the word was originally used for Greek invaders who were the first foreigners to have the political designs. Looking the early antiquarian remains from the Oxus region one derives the natural conclusion that like Gandhāra this land was also the scene of frequent changes and disturbances as a result of which different group of people came, settled and left their impress of art and culture.

Oxus region and Mathurā

The relation between Mathurā and the Oxus region although remote and indirect may be traced on the basis of the following three factors *viz.*:

1. The Artifacts of Mathurā found in the Oxus region lying to the north and south of the river;
2. Artifacts made in the Oxus region but bearing impact of the Mathurā style, and
3. Early religious themes and iconic feature suggesting knowledge of Mathuran and inner Indian traits.

Among the first category we find a silver dish carved with an elephant carrying a ridder in a *haudā*; stylistically it should belong to the Kushāna period.[33]

The other is an embossed silver plate depicting Mahākāla seated by the side of his Śakti. This should be assigned to the post-Kushāna period.[34] Besides, some ivory objects of the Kushāna age unearthed at Dalverzintepe (Uzbekistan) may be conjectured to have been imported from Mathurā. One comb which has the upper portion etched with a figure bears several Mathuran characteristics *viz.*, elongated form, voluptuous bosoms and heavy and broad anklets.[35] The other shows a woman and an elephant rider, the composition being typical Indian.[36] On the other hand, some gold bars bearing Kharoshṭhī inscriptions were donated by the monks from Kalyān.[37]

The objects of the second category (*i.e.*, those made in the Oxus region but bearing the impact of Mathurā) include the following:

A dancing girl from Karabulak closely resembles a Sālabhanjikā or a damsel on the railposts of Mathurā. Her stance, dress, ornaments and the posture of akimbo remind us of the typical Mathuran attitude. This must belong to about 2nd-3rd century A.D.[38]

A few motifs also seem to have their origin in Mathurā art. Mention may be made of a male figure found at Delverzhin (in Afghanistan). He feeds grapes to a parrot pearched on her left hand.[39] Similar figurines are noticeable in sculptural art of Mathurā. At Kara-Tepe near Terize we have also found some female figures who hold a child in arms. These bear a great deal of affinity with the Mātrikās found in stone and terra-cotta of the Kushāna period at Mathurā.[40]

The third variety of remains of the Oxus region bearing the Mathurā impact are of

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religious nature. Some figures from Kara-Tepe are in *ardhaparyankāsana* posture of sitting with one leg hanging down and the other held across. This is a Mathurā or central Indian trait. The posture of half upraised hand with the gesture of preaching (*upadeśa* or *pravartana*) attitude bespeaks the same phenomenon.[41]

A wall painting at Dalverzhin depicts Śiva and Umā on a bull. The concept of showing Umā and Maheśvara (i.e. Śiva and Pārvatī) together is again very much Indian in origin and must have emerged first at Mathurā. The large bull used as mount (Nandī) is again an Indian theme. This has been dated to 2nd-3rd century A.D.[42]

To conclude there seems some affinity between the remains found in the Oxus region and that of Mathurā in the early centuries of the Christian era. Most of the Indian traits noticed in the material culture should be attributed to Mathurā as it was the major art centre and the most important part of the Kushāna empire in inner India. The art traditions flourished here several centuries before the Kushāna period and it was in direct contact with other centres in the Western territory of the Kushānas. The intermixing between Mathurā and Gandhāra is well known, but the adjoining regions like Oxus were also naturally effected. The impact seems to have been through Gandhāra but the direct influence and exchange can also not be ignored. But the exact magnitude of this interaction and particularly the contribution of Mathurā in the growth of art in the Oxus region is yet to be fully realised and the subject warrants a deeper probe.

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OBSERVATIONS ON *VĪṆĀ* ON INDIAN COINS

SAMARESH BANDYOPADHYAY

In "A Note on Musical Instruments on Indian Coins" published in the *Journal of the Numismatic Society of India*, Vol. XLVIII, 1986, pp. 121-122, attention has been drawn at first to the well known representation of 'lyre' on the Lyrist Type of Gold coins of Samudragupta and Kumāragupta I by B. N. Mukherjee, Carmichael Professor and Former Head of the Department of Ancient Indian History and Culture, University of Calcutta, who, citing his own article "A Lyrist Type of Copper Coin (of the Gupta King ?)" in the *Journal of the Asiatic Society*, 1958-59, pp. 35-36, states that 'some copper coins with a male figure playing on lyre are also known'. No reason has, however, been offered by Mukherjee as to how he sticks to his view regarding the representation of lyre on the copper coin (Plate I.1—Enlarged) published by him in the aforesaid volume of the *Journal of the Asiatic Society* more than 20 years after the attribution of the said coin to the Hūṇas by T. P. Verma[1] and acceptance of Verma's view by J. P. Singh[2] nearly ten years before the publication of Mukherjee's note on musical instruments on Indian coins, referred to above. Verma observes that 'actually it is a sceptre which Mukherjee mistook for a lyre in the king's left hand. Probably the object in king's right hand is the upper portion of the hilt of a dagger or a small sword.' Verma considers the coin to be a third specimen of a type of Ephthalite copper coin published by A. Cunningham[3] who has described it (Plate I.2) as follows:

> Metal—Copper. Weight—57 Grains.
> *Obverse:* 'King seated to front, right hand on hip, left hand holding sceptre'.
> *Reverse:* 'Seated Goddess, holding flower in the left hand. Indian Legend written reversed, *Jayatu Sri Narendra.*'

Mukherjee refers to the same coin described and published by Cunningham and states further that a few of the copper coins 'with a male figure playing on lyre' 'belong to Śrī-Narendra' and, according to him[4], the male figure on the coin is wrongly described as holding a sceptre by Cunningham.

It would appear from the discussion above that while the representation of lyre on the copper coin published by Mukherjee has been doubted with reasons not challenged as yet, the indistinct object, which Mukherjee intends us to take as lyre, on the copper coin published by Cunningham, has been taken as a sceptre by Cunningham, Verma and Singh.

The instrument shown as placed on the lap of Samudragupta (*c.* 335-376 A.D.)

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3A

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4A

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7A

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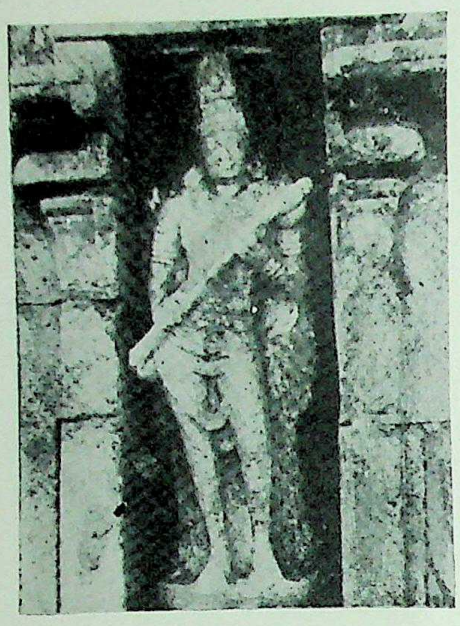
PLATE II



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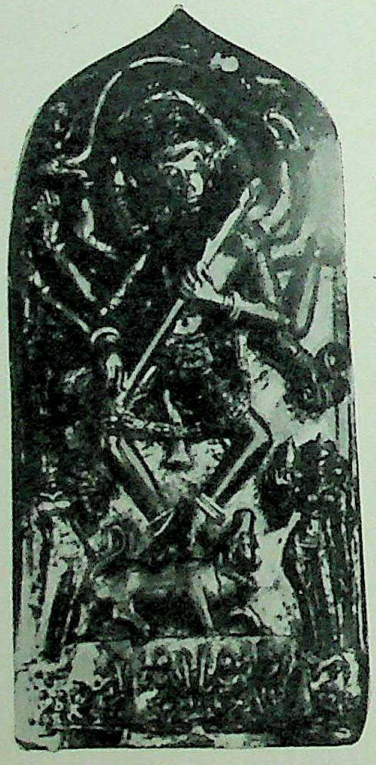

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in his Lyrist Type (Plate I.3 and 3A—Enlarged) of gold coins[5] has been described as 'Indian lyre' (*vīṇā*)[6] by V. A. Smith and as 'Indian lute or lyre (*vīṇā*)'[7] by John Allan who, however, in a footnote[8] states that 'it is really a kind of guitar'. A. S. Altekar describes the same instrument which is also seen resting on the lap of Kumāragupta I (414-455 A.D.) in his Lyrist Type (Plate I.4 and 4A—Enlarged) of gold coins[9] sometimes[10] as lute which he considers[11] to be the same as *vīṇā* and sometimes[12] as 'lyre (*vīṇā*)'. The description of the instrument as 'stringed lute' in some places[13] by Altekar is, however, unwarranted since the lute itself is a stringed instrument.[14] J. N. Banerjea appears to describe the instrument on the coins of Samudragupta as 'harp-like *vīṇā*' which, according to him, 'appears for the first time in a Bharhut rail pillar, it being placed in the hand of' a handsome female figure, standing in a graceful pose on what looks like a lotus pedestal, (Plate I.5), which is taken as 'an early iconic form of the Hindu deity Sarasvatī' by B. M. Barua[15] and as 'probably the prototype of Sarasvatī, the goddess of fine arts and learning' by Banerjea.[16] Such type of *vīṇā* is also noticeable in the early sculptures at Besnagar and Amarāvatī[17] and in the Buddhist caves of Pitalkhora[18], besides in the sculptures at other sites like Sanchi, Pawaya, Nāgārjunakoṇḍa, Goli, Mathura and Gandhāra.[19]

The *vīṇā* on Gupta coins, as Lath aptly describes it, 'was shaped like a bow that faced down with a tilt or an angle with one open end protruding upward and the other, lower end, forming a hollow belly which served as the sounding board of the instrument. The *vīṇā* strings were stretched across the structure like bow-strings. In playing, the sounding belly was usually placed on the laps. Strings were so arrayed in the playing position that the lower a string, the shorter is its length. The still surviving south Indian instrument *yazh* resembles this old *vīṇā* ; most similar in structure to the ancient one, however, is the Burmese harp[20] which seems to have been handed down in an almost unchanged form since ancient times.'[21]

Representation of the bow-shaped *vīṇā* being placed on the lap of a female figure is also noticeable in the depiction of Trivikrama's triumph over Bali (Plate I.6) from Pawaya, assigned to the 5th century A.D. and now preserved in the Gwalior Museum.[22]

Mention may be made in this connection of a bow-shaped *vīṇā* on the lap of a *gaṇa* accompanying Śiva's representation as *saptasvaramaya*[23] from Parel, assigned to the 5th century A.D.

As regards an Eastern Indian sculptural representation of *vīṇā* of the same bow-shaped type, attention may be drawn to its depiction as being played on by the goddess Sarasvatī shown seated on a stalk of lotus held in his upper left hand by god Viṣṇu (Plate I.7 and 7A—Portion with Sarasvatī carrying *vīṇā*—Enlarged). N. K. Bhattasali describes[24] this *vīṇā* as a 'boat-shaped instrument' and, according to him, the antique shape of the *vīṇā* and certain other features including the simplicity of design, strongly reminiscent of Gupta sculptures, lead the image of Viṣṇu to be assigned to the Pre-Pāla period.

An image of Sarasvatī with bow-shaped *vīṇā* placed in a similar fashion as is seen in the image of Sarasvatī held by Viṣṇu, just referred to, from Java has been illustrated (Fig. 42) in Amulyacharan Vidyabhushan's work (p. 100) entitled *Sarasvatī* (in Bengali).

The bow-shaped *vīṇā* in the lap of a person accompanying the sixteen handed dancing

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Śiva figure from Phong Le, assigned to the 9th century A.D. and now preserved at the Cham Museum,[25] Da Nang, also deserves a mention here.

II

In this connection it is indeed interesting to point out that, besides the Lyrist Type of gold coins of the Gupta kings mentioned above, a half *Varāha* in gold[26] of the Vijayanagara King Harihara II (1377-1404 A.D.) bears a representation of *vīṇā*. This coin type is amply documented in scholarly publications, though, surprisingly, it escapes notice altogether in the brief survey of musical instruments on Indian coins by B. N. Mukherjee, referred to above.[27] The *vīṇā* on Harihara II's coin (Plate I.8 and 8A) has been depicted as held by a two-handed seated figure of Sarasvatī who is represented here, interestingly enough, along with Brahmā.[28] It is rather strange that no reference to this interesting *vīṇā-hastā* Sarasvatī on a coin, known from 1935, has been made by J. N. Banerjea[29] and B. Sahai[30] in their treatment of the subject.

The *vīṇā* on Harihara II's coin is a 'rod-like thing', 'arch-like rod' or 'rod-like object', presumed sometimes[31] to represent the *Rudra-vīṇā*. It is shown as held by Sarasvatī in her left hand, its upper portion being depicted as resting on her left shoulder and the lower portion on her left thigh. Thus, it reminds one of its almost similar representation in the two-handed terracotta figure of *Vīṇādhara Dakṣiṇāmūrti* of Śiva (Plate I.9)[32] seated on bull, assigned to the Śuṅga period, though the upper portion of the *vīṇā* in the same piece shows a little bend. Long and straight representation of *vīṇā* held in left hand is also found in an interesting eight-armed image of *Naṭarāja*, assigned to the 10th century A.D., from the Jhalāwar Museum.[33]

It should, therefore, be noted that the *vīṇā* on Harihara II's coins is not like the bow-shaped *vīṇā* depicted on the gold coins of Samudragupta and Kumāragupta I, and in the sculptures including those from Bharhut, Pawaya, Parel, Eastern India, Java and Phong Le, referred to above, nor is it shown as resting on the lap, as it is seen to be represented on the gold coins of the said Gupta kings and in the different sculptural representations, noticed above.

Further, it is be noted that though the *vīṇā* here is a long and straight instrument, it has not been shown in the manner in which it is generally found to be represented being held across the body in two or more handed figures of Śiva, standing, seated or dancing,[34] in a two-handed and seven-hooded figure of Nāginī playing on the instrument[35] and also in two or more handed seated, standing or dancing figures[36] of Sarasvatī.

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In the *Progress Report of the Archaeological Survey of India, Western Circle*, 1916-17, a gold coin has been described (pp. 2, 5 and 50) as follows:

Obverse: King seated on a high-backed couch, with one foot hanging; wearing waist-cloth; hand to left touching lyre or feeding some animal; legend—*Paramabhāgavata Mahā....*

Reverse: Figure of Lakṣmī seated on a footstool, with a seat over it; holds uncertain object in hand; to left crescent; legend—*Vikramāditya(ḥ).*

If the king is really playing on lyre and if the reading of the legends on the coin is correct, then the coin may be taken as a specimen of the *viṇā* type of coin of Candragupta II. But, as has been pointed out (*Journal of the Asiatic Society*, Vol. I, No. I, 1959, p. 35, note 2 and *Journ. Num. Soc. Ind.*, Vol. XXXIX, Parts I-II, 1977, p. 115, note 2), no photograph of the coin has been published and hence there is no scope to verify the description of the coin and the reading of its legends. Moreover, if the coin type really existed, some other specimens would have been available by this time, but that has not been the case.

A silver coin weighing 74 grains in the possession of one Sri Ramgovind Prasad of Bhavua, Sahabad District, has been described (*Journ. Num. Soc. Ind.*, Vol. XXI, 1959, p. 191) by Altekar as follows:

'On the obverse the king is playing on lute as usual, the back of the sofa being slightly sloping. The reverse shows the goddess seated on a wicker stool, having cornucopiae in one hand and a noose in the other. The legend Samudragupta was distinct.'

But, as the weight of the coin does not conform to the usual weight (33 grains) of Gupta silver coins, Altekar (*ibid.*, p. 192) considers it as 'obviously a forgery of ancient times, when somebody used the dies of the gold type for issuing a silver piece'.

[6]*Op. cit.*, p. 101. D. C. Sircar (*Studies in Indian Coins*, Delhi, 1968, p. 378) follows Smith in describing the instrument.

[7]*Op. cit.*, pp. lxxv and 18. P. L. Gupta (*Coins*, Second Revised Edition, New Delhi, 1969, p. 55) also describes it as 'Indian lute'.

[8]*Op. cit.*, p. lxxv, note 1.

[9]*Cat. Gup. Go. Co. Bay. Ho.*, pp. cx, 302-303 and Plate XXXI. 4-5; *Coin. Gup. Emp.*, pp. 211-212 and Plate XIV. 5.

[10]*Cat. Gup. Go. Co. Bay. Ho.*, p. cx; *Coin. Gup. Emp.*, p. 73.

[11]*Coin. Gup. Emp.*, p. 76.

[12]*Ibid.*, p. 73.

[13]*Cat. Gup. Go. Co. Bay. Ho.*, pp. lxix, 57 and 302. According to Altekar (*ibid.*, p. 302), the lute on Kumāragupta I's coin is a four-stringed one.

[14]*Cf. Encyclopaedia Britannica*, Vol. 14, 1965, p. 436; Vol. 15, 1965, p. 1084.

[15]*Bharhut*, Vol. II, p. 75.

[16]*The Development of Hindu Iconography* (henceforth *Dev. Hind. Icon.*), Second Edition, University of Calcutta, 1956, pp. 303 and 377-78. S. V. Sohoni (*Journ. Num. Soc. Ind.*, Vol. XIX, Part II, pp. 151-161) and Mukund Lath (*ibid.*, Vol. XXXIX, Parts I-II, 1977, pp. 114-123) also take it as *viṇā*. Scholars while dealing with these coins generally take the Gupta kings as *viṇā*-players but, according to Lath, 'the kings are shown as singing' and *viṇā*-playing is, in the coin portrayal, an auxiliary activity.

[17]*Coin. Gup. Emp.*, p. 74.

[18]Swami Prajnānānanda, '*Saptatantrī viṇā* in the Sculptures of Buddhist Caves of Pitalkhora', *Roop-Lekha*, Vol. XXXII, No. 1, July, 1961; cf. also *Journ. Num. Soc. Ind.*, Vol. XXXIX, Parts I-II, 1977, p. 116 and note 7.

[19]Cf. K. Krishna Murthy, *Archaeology of Indian Musical Instruments*, Delhi, 1985, p. 26. For *viṇā* of the type of the Gupta coins i.e. bow-shaped, from Sanchi, see *ibid.*, Fig. I. 1, from Bharhut, *ibid.*, Fig. II.1, from Amarāvati, *ibid.*, Fig. III. 1-2, from Nāgārjunakoṇḍa, *ibid.*, Fig. IV. 1 or 8 and 2) and from Gandhāra, *ibid.*, Fig. V. 1. A *viṇā* of harp type is also illustrated by a terracota figurine found at Rupar (Y. D. Sharma, 'Past patterns in living as unfolded by excavations at Rupar', *Lalit Kala*, Nos. 1-2, Fig. 24). One noteworthy feature of the harp type *viṇā* is that as early as in the first century A.D. it appears in the frescoes in the Samarkand and on a frieze slab from Airatem in Uzebekistan. Later it travels to South-East Asia and still survives in Burma by the name *Saun* and among the Afghan Tribes on the North-Western frontiers of the subcontinent' (K. Krishna Murthy, *op. cit.*, p. 26). 'This type of harp-shaped *viṇā* was evolved, evidently on the principle of bow and resonator as it would be seen from its plastic representations. It occurs as early as in the prehistoric paintings of Central Asia (D. H. Gordon, *Prehistoric Background of Indian Culture*, Bombay, 1958, p. 106 and Plate 14.2), 'which

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all the more supports the contention of Sivaramamurti that this harp was fashioned after the hunting bow, having the strings of gut and may be regarded as the pre-runner of all the musical instruments in the world. In ancient Egypt, the bow harp was called *bjn* or *bin* which becomes *vini* in Koptic. In fact, the musical instrument harp has a great antiquity' (*ibid.*, p. 24; C. Sivaramamurti, *Amarāvati Sculptures in the Madras Govt. Museum*, Madras, 1956, pp. 114-115; Coomaraswamy in *Journ. Am. Or. Soc.*, Vol. 51, p. 47; E. A. Wallis, *A Guide to Egyptian Collections in the British Museum*, 1909, p. 87 and Plate IX).

[20]For an illustration and description of the Burmese harp, see *Die Musikinstruments Indians and Indonesians*, *Curt Sachs*, pp. 140-141.

[21]*Journ. Num. Soc. Ind.*, Vol. XXXIX, Parts I-II, 1977, pp. 116-117.

[22]Sivaramamurti, *Naṭarāja in Art, Thought and Literature*, New Delhi, 1974, pp. 9-10 and Fig. 2.

[23]*Ibid.*, p. 176 (Fig. 13).

[24]*Iconography of Buddhist and Brahmanical Sculptures in the Dacca Museum*, Dacca, 1929, Reprint, Varanasi and Delhi, 1972, pp. 86-87 and Plate XXXII.

[25]Sivaramamurti, *op. cit.*, pp. 361-362 and Fig. 18.

[26]*Annual Report of the Mysore Archaeological Department for the year* (henceforth *Ann. Rep. Mys. Arch. Dept.*), *1932*, Bangalore, 1935, p. 81 and Plate XXI. 11; N. Ramesan, *Andhra Pradesh Government Museum Series, No. 4—A Catalogue of the Vijayanagara Coins of the Andhra Pradesh Government Museum*, Published by the Government of Andhra Pradesh, Hyderabad, 1962, p. 57; A. V. Narasimha Murthy, *The Coins of Karnataka*, Mysore, 1975, p. 150; *Journ. Num. Soc. Ind.*, Vol. XLIV, Parts I-II, 1982, p. 176; *ibid.*, Vol. XLVI, Parts I-II, 1984, p. 116.

[27]See Paragraph 1 above.

[28]In the *Skanda Purāṇa* (Brahma-Khaṇḍa, Setu. 40) and the *Padma Purāṇa* (Uttara-Khaṇḍa, Chapter III), Sarasvatī and Gāyatrī are described as the two wives of the god Brahman, while Sarasvatī and Lakṣmī are generally regarded as the two wives of Viṣṇu in East Indian mythology (cf. *Foreigners in Ancient India and Lakṣmī and Sarasvatī in Art and Literature*, ed. D. C. Sircar, University of Calcutta, 1970, p. 139). Sarasvatī's association with Nārāyaṇa is also recorded in certain inscriptions (*ibid.*, pp. 108-109, 139).

[29]Cf. *op. cit.*, p. 265.

[30]Cf. his *Iconography of Minor Hindu and Buddhist Deities*, New Delhi, 1975, pp. 141-155.

[31]Cf. *Ann. Rep. Mys. Arch. Dept.*, 1932, p. 81; Ramesan, *op. cit.*, p. 57; *Journ. Num. Soc. Ind.*, Vol. XLVI, Parts I-II, 1986, p. 116.

[32]Reproduced from Sivaramamurti, *op. cit.*, p. 169, Fig. 4.

[33]*Ibid.*, p. 319, Fig. 198. The artist's attempt to combine the concepts of *Vīṇādhara* and *Naṭarāja* is apparently to reveal both the dual personality of Śiva as a master musician and great dancer and also the inseparable association of music with dance.

[34]Of the numerous sculptural representation of Śiva holding *vīṇā* across the body, our Plate II.1 shows a two handed standing image of *Vīnādhara Dakṣiṇāmūrti* (cf. Gopinath Rao, *Elements of Hindu Iconography*, 2nd Edition, Varanasi, New Delhi, 1971, pp. 289-292) from Muvārkovil, Kodumbālūr, Pudukkottah (reproduced from K. A. Nilakanta Sastri, *The Colas*, 2nd Edition, Madras, 1955, p. 727 and Plate XVII. Fig. 38) and for a four handed seated figure from Ellora, assigned to the 5th century A.D., see Sivaramamurti, *op. cit.*, p. 171 and Fig. 8; for 2 four handed standing images from Dharmarājaratha, Mahābalīpuram, both assigned to the 7th century A.D., see *ibid.*, p. 195 and Fig. 40 and p. 196 and Fig. 41 respectively; for a four handed standing image playing on *vīṇā* from the Kailāsanātha temple, Kāncīpuram, assigned to the 7th century A.D., see *ibid.*, p. 200 and Fig. 48; for a four handed standing image from Lakhamaṇḍal, assigned to the 9th century A.D., see *ibid.*, pp. 323, 326 and Fig. 204; for a four handed *Naṭarāja* from Gopeśvara, assigned to the 9th century A.D., see *ibid.*, p. 314 and Fig. 194; for a four handed dancing figure with group of Mātṛkās from Abaneri, assigned to the 9th century A.D., see *ibid.*, pp. 324, 327 and Fig. 205; for a four handed *Naṭarāja* from the Kāmākhyā temple, Assam, assigned to the 10th century A.D., see *ibid.*, p. 305 and Fig. 183; for a four handed dancing image from Modhera, assigned to the 11th century A.D., see *ibid.*, p. 329 and Fig. 216; for an eight handed image of *Naṭarāja* from Asanpet, Orissa, see *ibid.*, p. 177 and Fig. 14; for a ten handed image of *Naṭarāja* from Noleśvar (now in the Jaipur Museum), assigned to the 9th century A.D., see *ibid.*, p. 320 and Fig. 199; for a ten handed image of *Naṭarāja* dancing on bull (now in the Asutosh Museum, University of Calcutta), assigned to the 12th century A.D., see *ibid.*, pp. 302, 304 and Fig. 180; for a twelve handed image of *Naṭarāja* on bull to left and bull to right, see our Plate II.2 and 3 respectively (both reproduced from N. K. Bhattasali, *op. cit.*, pp. 115-116 and Plate XLV); Bhattasali described (*ibid.*, p. 116) the dancing figure on bull from the *deul* of Rāṇīhāṭī to be in perfect preservation, but the principal left hand holding *vīṇā* of Sivaramamurti's illustration (*op. cit.*, Fig. 174) of the Rāṇīhāṭī image is damaged, though the latter refers (*ibid.*, pp. 300-301) to the image as illustrated by Bhattasali. Bhattasali's illustration of

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the image in *op. cit.*, Plate XLV, which also illustrates the Nātghar image, has, moreover, the well executed ecstatic bull, on which Śiva is shown dancing, to the right and not to the left as is seen in the Rāṇīhāṭī image illustrated by Sivaramamurti (*op. cit.*, Fig. 174). For a twenty-four handed dancing figure on bull from Khuong-my (now in the Cham Museum, Danang), assigned to the 8th century A.D., see *ibid.*, pp. 362-363, Fig. 21 and for another similar representation also preserved in the same Cham Museum, assigned to the 8th century A.D., see *ibid.*, pp. 362 and 363 and Fig. 20. Though described (*ibid.*, p. 362) as 'Twenty-armed', the figure seems to have more arms.

[35]See our Plate II.4 (reproduced from J. N. Banerjea, *op. cit.*, Plate XX.2).

[36]For the representation of a two handed seated representation of Sarasvatī holding *vīṇā* across her body, assigned to the 10th century A.D., see Sivaramamurti, *op. cit.*, pp. 325-328 and Fig. 207 showing *Naṭeśa* at the centre. Our Plate II. 5 shows a four handed seated figure of Sarasvatī (reproduced from Bhattasali, *op. cit.*, Plate LXIII) with *vīṇā* held across her body. A two handed beautiful standing Sarasvatī image is at the Asutosh Museum of the University of Calcutta (see J. N. Banerjea, *op. cit.*, Plate XVIII.3). The six handed image of Sarasvatī from the Hoyasaleśvara temple at Halebid, Karnataka, shows the goddess dancing holding *vīṇā* across her body (see Gopinath Rao, *op. cit.*, Vol. I, Part II, Plate CXVI.2 and Sahai, *op. cit.*, p. 154 and Fig. 26).

Under the kind direction of Dr. R. C. Sharma, Director, Indian Museum, the staff of the Photography Section of the Museum and Sri Gour Krishna Ghosh, Publication Superintendent of the Museum, took special care in preparing photographs of some of the illustrations in the article. Our sincere thanks are due to all of them.

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PAINTINGS OF JAMINI RAY IN THE INDIAN MUSEUM

SIPRA CHAKRAVARTI

JAMINI RAY, the gifted artist of Bengal played a role of profound significance in the contemporary Indian Art. His paintings are remarkable for the inherent poise and vitality as well as simplicity, economy of lines and boldness. Jamini Ray tried to revive the traditional culture of Bengal through his artistic pursuits and brought it to the notice of the Western world, which is sophisticated and at the same time portraying the essence of folk art. But inspite of the allegience to folk art the paintings of Jamini Ray manifest all the qualities of modern art. Besides, the family tradition and the culture of the country, the surroundings where he was brought up greatly influenced his artistic career. Born in the village at Beliatore in the Bankura district of West Bengal in 1887, Jamini Roy from his childhood familiarised himself with the indigenous culture of the country. The artistic mind of Jamini Ray was greatly impressed by the works of the village craftsmen like the potter, the carpenter, the blacksmith, the bell-metal worker, the weaver, the clay modeller, the conch-shell worker and the *patuas* and even the simple, artistic rice-paste drawing or *alpana* of rural women. In addition to this the beauty of the simple primitive mode of life of the Santhals and their music and dance had left a great deal of influence on his mind. All these had a lasting impress working on his mind.

Jamini Ray joined the Government School of Art in Calcutta in 1903 at the age of sixteen and was admitted in the Western Academic Art Section. Percy Brown, the then Principal of the Art College was so much impressed by his talent that he allowed him to attend any class of the Art School and made arrangements for exhibiting some of his paintings in the class room. This Western academic training nodoubt produced good results in his career as a painter and helped him to attain technical competence and maturity. Jamini Ray had a checkered life and acquired various experiences in his career life. He took a job of plate retoucher in a printing press in Allahabad where he learnt a great deal about the blending of colours. After coming back to Calcutta he took different types of work, which included making of greeting cards for Jewish trader, working in a lithographic press or as a salesman in a cloth shop or colouring cheap wood-cuts for a press at Battala. Besides, Jamini Ray also had keen interest in theatre and he painted background sceneries for the theatre. Here also he came to realise the close link between reality and illusion. His inquisitive mind always tried to acquire something from these different types of profession and no doubt enriched his ideas and enlarged his knowledge.[1]

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To earn his livelihood Jamini Ray started painting portraits in oil of rich persons. His portraits in oil revealed his great mastery and technical dexterity in Western technique of painting. The portraits done by Jamini Ray are still now in the collection of many aristocratic families and a good number of such paintings were painted after photograph. His portraits and nude studies reflect the technical mastery of Rambrandt and Sargent. In 1920-30 Jamini Ray, was also attracted to the works of Impressionist artists Van Gogh and Cezanne and he made many of the paintings in the style of Rambrandt, Van Gogh, Matisse, El Greco, Van Dyck etc. Of the remarkable paintings of this period mention may be made of ploughman, at sunset prayer, Van Gogh, Self portrait with Van Dyck beard, Toilet, Baul, etc. These realistic portraits and paintings in oil brought both fame and economic prosperity for Jamini Ray.[2]

But gradually Jamini Ray felt that paintings in oil was not his own medium as he could not satisfy his artistic spirit, his mind and his taste by mere drawing portraits in oils. This realisation, the turning point in his life arrived at the age of thirty-four (in 1921) and he no longer continued to work in the European academic tradition.

Besides, Jamini Ray could not remain aloof from the Swadeshi movement of nineteen twenties. He realised that without social consciousness of the living tradition an artist cannot attain mastery in his work of creativeness. He gradually began to deviate from the European academic technique of drawing portrait and landscapes to indegenous art tradition. During this transition period he painted some large paintings in Chinese and Japanese technique. The style of Bengal school also did not evoke any interest in him. The real answer to his inner quest, Jamini Ray found in the living folk art tradition and culture of Bengal, with whom he had great intimacy and understanding from his childhood. He realised that the elemental truth of art has been best illustrated by the *patuas* as well as by the village craftsmen like clay modeller, wood-carver, blacksmith etc., where theme and technique are very simple and easily communicative. But there is no doubt that his early academic training in European tradition had laid down the foundation of his artistic development and his contribution to the art movement as a whole. But Jamini Ray judiciously and skillfully utilised his training and blended it with his own heritage to produce an art that was completely and entirely indigenous both in form and colour. Jamini Ray tried to portray the same vitality and tradition, the simple pure form and symbolic quality of the folk painting and folk toys in his painting.

After a long period of formal experiment Jamini Ray achieved his ultimate goal based on extreme simplification and concentration on essentials. Thus his paintings represent a true pictorial form and unity of design with rhythmical poise. This new phase was also marked with change in techniques and methods. The simplification of form also led him to the simplification of colours. He rejected the imported chemical colours in tubes and like the *patuas* began to prepare colours in indigenous method. The seven rainbow colours consisting of his palette were Indian red, obtained from *geri mati*, yellow ochre, adapted from *holi mati* or *harital*, black from lamp black, blue from indigo, white from common chalk, vermillion from mercury powder and grey from alluvial mud. The binding medium of these colours were the glue of tamarind seeds or the white of egg. His paintings are mostly done in tempera and gouache technique. Instead of canvas Jamini Ray began to use cheap home-made cloth coated with alluvial soil, cowdung and lime, as well as paper, hand-made card board and wooden boards.

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What Jamini Ray wanted to recreate was not the revival of old folk art tradition, but to give birth to a new forward art based on still living folk art, as well as imbibing new trends and traditions from the Impressionists and Post-Impressionist ideas. It seems that Jamini Ray was familiar with new evaluation of art brought by the Post-Impressionists particularly by the Fauvist artists who instead of giving importance to the subject matter emphasised the inner reality and formal quality of the painting and gave importance to the flat surface of the painting and its division of space and to the predominance of lines and free use of colours.[3]

Jamini Ray successfully evolved a personal diction of his own art out of original elements from the folk art of Bengal and from the modern Western trends. He freed his style, form and colour from the conventional artistic bonds. A solo exhibition of paintings and drawings by Jamini Ray based on folk art traditions first came on view at Government School of Art in 1929 and was opened by A. H. Watson the editor of the Statesman.

Regarding subject matter of his painting it may be said that in the early phase he painted many European subjects, landscapes and portraits. After his mastery in Western technique when he returned to Indian tradition his subject matter also completely changed. The paintings now vibrant with colour and rhythmic lines represent scenes from the *Ramayana* or the *Krishnalila* or the village craftsmen like carpenter, blacksmith, paintings of gods and goddesses, cultivator, *bauls*, *fakirs*, *vaishnava*, *vaishnavis*, santhal men and women, birds, animals as well as dolls and toys. All these subjects have been treated by Jamini Ray in his own artistic notion in variety of forms and colours. But the most important theme of the paintings of Jamini Ray is the subject of mother and child and the depiction of woman. Sometimes she is depicted in her motherly aspect, sometimes as a village or santhal woman or sometimes she is depicted as a sophisticated woman. Probably no other artist in India has emphasised this theme in so many different ways with so much affection and naively as Jamini Ray. The tenderness of woman, her beauty and her affection have been expressed by the artist in different ways with great care and sympathy at different epochs of his artistic life. He never depicted any shrewd woman.

In this naive grouping of mother and son both are generally shown wrapped in the folds of the *sari* excluding the faces. Other paintings of this theme show mother seated on the ground with her son on the lap drawn with three or four vital sweeping brush strokes representing the linear harmony and true spirit of the *pat*. But the most beautiful painting of this group is the mother helping the child to cross a pool with her hand on his head is a superb work of the artist with sentimental appeal portraying the tenderness and love of mother to her son.[4] This painting which was exhibited in the Annual Exhibition of Academy of Fine Arts in 1935 was awarded Viceroy's gold medal and hundred rupees as best painting. Similarly the subject of Christ and the biblical stories have been delineated with strong force and firm lines. Besides two paintings *viz*. beating of the Indians by the English soldiers and the massacre of the innocents of the biblical story, Jamini Ray seldom depicted any violent scenes.[5] The most striking inclusion in the subject matter, however is the figures of animals like horse, cow, tiger, cat, bull, elephant which have close resemblance with wooden and terracotta toys of Bengal. Though the cat with lobster in the mouth a popular painting of Jamini Ray is drawn after *Kalighat pat* yet in the brush of the artist it has become more naive and vivid in linear treatment and colour.

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Like folk art Jamini Ray also wanted that the message of his painting with evocative line and simple form and without decorative elements would be direct to the viewer. Jamini Ray stressed greatly on the formal aspect and linear treatment of the painting. He was greatly fascinated by the bold sweeping lines of the *Kalighat pats* and some of his earlier works particularly the composition of women are characterised by curvilinear drawing and bold sweeping lines of the *Kalighat pats*. These paintings are remarkable for the charm of drawing and serene beauty. The Indian Museum possesses three such paintings in *Kalighat pat* style. The human figures in his paintings are to some extent summary account of the folk tradition and painted in terse line vibrant with energy. The supple, terse, linear treatment without any decoration concentrate our focus on the essential geometrical character of the subject with an indication of organic form, and kindling our interest. Simple architectural motifs and dots are the only decorative motifs found delineated in his paintings.

Jamini Ray achieved this simplification of form and line after his long search and experiments. One can find innumerable variations of forms in the paintings of Jamini Ray which he derived from the different sources of the folk art of Bengal like terracotta plaques of the temples, wooden dolls like *Alhadi Putul* or mummy dolls, clay dolls, *Jadupat*, *Jaranopat*, *Kalighat pat*, *alpana* as well as embroidered *Kantha*[6]. He was also greatly inspired by folk art tradition of Orissa. A few works of the artist in the collection of the Indian Museum represent characteristic bold simplification, geometrical patterns and forceful rhythm of mummy dolls, '*Kalighat pat* and *alpana* designs.'

His search and experiments for purer line and abstract form resulted the brush drawings in lamp black which were best illustrated in the studies of 'Christ', 'mother and son' etc. Jamini Ray tried to assimilate the human and divine character into one by abstract symbolic means of folk art tradition. "In particular one can find a close parallel between Jamini Ray's studies of Christ and the anonymous folk painters of the 12th century whom Gauguin copied.[7] His Christ studies though portrary the innocence and simplicity of the Byzantine paintings they are all represented with some distortions typical of Jamini Ray's style with undifferentiated bodies, large head, large open protruding eyes and beard, a novel structural form which have little resemblance with the emotive appeal of the Byzantine painting. Jamini Ray tried to visualise Christ as appeared to his imaginative mind through elliptic sweeps and expressive contours. Crucifixion, the last supper, the flight to Egypt, the Annunciation, are some of the well-known paintings of Jamini Ray related to Christian myth. One of the most simplified forms of crucifixion painted on cloth and the flight to Egypt of Jesus with his parents are the two paintings by Jamini Ray which enrich the painting collection of the Indian Museum.

The linear treatment as well as contour of the form portray vitality and striking individualistic expression of Jamini Ray though Amrita says that "Jamini Ray's line is architectonic, self conscious, deliberately realised, never a first rapture of the inspiration".[8] Sometimes the figures were outlined with smooth thick or thin or with broken, uneven lines. Sometimes the figures were painted with a bunch of two or three coloured lines together suggesting three dimensional effect and depth. The delineation of the figures with thick precise outline as well as multicoloured lines enclosing the figures and the shining white eyes recall to our mind the traditional *patachitra* and *Santhal pats* of Bengal as well as mural paintings of Europe in France and Spain.[9] Another notable characteristic was that Jamini Ray made the frame, the surrounding, border, a vital

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element of the picture. In the early period the figures were painted in the middle with empty space all round. Later the figures began to touch the frame and he even allowed to overreach the frame or to spread out of it as noticed in the paintings of Gopini and Santhal woman. This is no doubt a revolutionary step adopted by Jamini Ray in his paintings.[10]

The paintings of Jamini Ray are particularly noteworthy for their colour composition. Colour played a dynamic and vital role in his painting. The use of both bright and soft colours along with dynamic lines infused a monumental quality in his picture. Jamini Ray preferred dissonant colours for decoration and delineation of the painting. The use of contrast colours like red and blue in large masses heightened the contours and projected the form to the utmost. Light has been infused in a subtle way by the painted bands of yellow or the whites of eyes. All these attribute the figures like Jesus Christ, *Gopini* or *Krishna-Balarama* a sculpturesque quality. His figures in groups looked like friezes. Similarly the Dancing *Gopis* or *Krishna-Balarama* in *tribhanga* pose had been derived from the terracotta tiles of the temple of Vishnupur and the sculptured Krishna of Dainhat.[11] This free use of colours indicates that Jamini Ray was greatly impressed by the work of the Fauvist artists like Matisse.[12] He was a great admirer of Van Gogh because of his tremendous application of bright colours. In his search for creating originality in form and colour and for new personal idiom Jamini Ray also imbibed the technique and different features of the pictorial art traditions of many countries. He was so much impressed by the scintillating effect of the coloured stones of the Byzantine mosaics and Russain icons that he adopted this technique in his Christ studies and other subjects by putting multi-coloured dots in tempera method. Jamini Ray was always in favour of new techniques and methods to enhance the inner reality or to infuse a new quality in the form of the subject. To reproduce the effect of mosaic the artist used woven palm leaf mat as Canvas which not only provided textural surface for the painting but the interstices of the mat also reflected light. By employing mosaic form of decoration Jamini Ray wanted to bring a textural effect, a glittering brightness on the surface of the painting. Though the figures are static yet the hands are represented holding something or in action. To achieve integrity in form and colour Jamini Ray used novel distortions in his figure. The conical face, broad, strong shoulder and the flat short body indicate derivations from clay dolls. The large head in the form of Jagannatha, wide open eyes extending beyond the face as well as a tubular torso are some of the distorted features in his paintings.[13]

Similarly in the panels of a group of Dancing or hunting Santhals with heads in profile, torsos in frontal attitude and feet in side view recall to our mind the Egyptian art tradition and the *Santhal pats*. The assemblage of the same figures in Santhal dance or *Kirtan* are also reminiscent of the relief panels of the brick temples of Vishnupur. Again the tendency to elongate the neck of the figures echoes the characteristic features of Modigliani, the French artist. While painting a human figure Jamini Ray always emphasised on its overall decorative design. His paintings become a synthesis of pictorial techniques of various countries and like a skill draughtsman he reconstructed the features with great mastery and originality. According to Benode Bihari Mukhopadhyay[14], the paintings of Jamini Ray represent transformation but no evolution. In every step in his search for novelty he stressed on the formal quality. Such rapid transformation may arise our curiosity but does not indicate artist's own style and idiom.

The Pen and ink-sketches of Jamini Ray are also as important as his paintings. All these drawings are simple, concise and with plastic quality. Jamini Ray drew these

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sketches as layouts for his painting. All these sketches are enclosed by square and rectangular frames.

The Paintings of Jamini Ray became popular among the people due to the attractive designs, simplicity of expression, bright colours and emotive appeal and above all, the small price. There is also great confusion about the different copies of the same painting by Jamini Ray. Jamini Ray admitted himself as *patua* where reproduction and duplication are part of the folk art. But in most cases he painted copies on request and of great demand.

The Art Section of the Indian Museum has in its collection some paintings of Jamini Ray which were acquired through purchase and gift. The total number of paintings is 34, of which 2 paintings are in oil, a few in water colour in wash technique and pen and ink drawings and the rest are in tempera.

All these paintings have been classified according to subjects in the following heads.

1. *Tillers of the soil, water colour in wash technique,* early work.
    1. At/80/258—Paddy cultivation (42 cm × 28 cm)
    2. At/80/259—Farmer smoking hookah (31·7 cm × 23·5 cm)
    3. At/80/260—Transplantation of the paddy cultivation (39·5 cm × 28 cm)
    4. At/80/261—Removal of paddy by cart (31 cm × 23 cm)

2. *Portraits in oil*
    1. At/79/234—Portrait of Harakumar Sarkar (51 cm × 38 cm)
    2. At/80/257—*Baul* with *ektara* (91·5 cm × 71·5 cm)

3. *Woman, tempera*
    1. At/79/249—Mother (69 cm × 38·3 cm)
    2. At/84/424—Three ladies (71 cm × 40·2 cm)
    3. At/87/800—*Gopinis* (41 cm × 38 cm)
    4. At/87/801—Three women (Dancers), 49·2 cm × 37·5 cm
    5. At/87/803—Beautiful lady (38·4 cm × 22·7 cm)
    6. At/88/821—Woman (44·5 cm × 27 cm)

4. *Santhal and others, tempera*
    1. At/88/816—Santhals with bows and arrows (34·3 cm × 23·5 cm)
    2. At/88/814—Tribal woman with pitcher (41·3 cm × 25 cm)
    3. At/88/822—Santhal women with pitcher (38 cm × 27 cm)

5. *European subject and technique, tempera*
    1. At/87/799—Crucifixion of Jesus (92·5 cm × 60·5 cm)
    2. At/88/813—Flight to Egypt (36 cm × 5 cm)
    3. At/87/805—Portrait of a queen (41·7 cm × 25·5 cm)
    4. At/87/806—Village house (36·5 cm × 41 cm)
    5. At/88/823—Army Officer, on cloth (53·8 cm × 35·3 cm)

6. *Mosaic technique, tempera*
    1. At/88/819—Drummer (65 cm × 33·3 cm)
    2. At/88/817—Doll on mat (47·3 cm × 24 cm)

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7. *Religion, myth and epic, tempera*
   1. At/87/802—Hanuman meeting Sita, in the Asokavana, scene from the Ramayana (49 cm×36·7 cm)
   2. At/88/820—Ravana, Jatayu, and Sita (61·2 cm×35 cm) (Scene from the *Ramayana*)
   3. At/88/825—Ram, Sita, Lakshmana and golden deer (57·7 cm×37·5 cm)
   4. At/88/826—Ganesh (49 cm×29·7 cm)
   5. At/88/827—Krishna playing flute (45·7 cm×31 cm)
   6. At/88/828—Vaishnava (42 cm×21 cm)

8. *Folk Art motif and animals, tempera*
   1. At/87/804—Cow in front of tub (39 cm×30·8 cm)
   2. At/87/807—Folk motif in *alpana* (77·5 cm×40.8 cm)
   3. At/88/818—Horse (55 cm×35·4 cm)
   4. At/88/824—Elephant with riders (56 cm×40·8 cm)
   5. At/88/815—Two dolls with folded hands (44 cm×21 cm)

9. *Drawings, nine ink drawings*
   At/87/808—
   (*a*) Yasoda-Krishna (14·5 cm×10 cm)
   (*b*) Framed paintings, horse, gopinis, cow (17·7 cm×13·7 cm)
   (*c*) Mother and Son (14·5 cm×9·5 cm)
   (*d*) Jesus Christ (14 cm×11·5 cm)
   (*e*) Orissan lion and dolls (13·5 cm×16·5 cm)
   (*f*) Deer (12·7 cm×11·8 cm)
   (*g*) Kaliyadamana Krishna (14 cm×12 cm)
   (*h*) Two women (18·7 cm×14 cm)
   (*i*) Yogi (17 cm×11·2 cm)

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[10]*Lalitakala Contemporary*, p. 18.
[11]*Ibid.*, pp. 16, 17.
[12]Dey, Bishnu, *Jamini Ray*, pp. 29, 43, 53; S. Suhrawardy further mentions that Jamini Ray in his younger days turned to Picasso as a result of his acquaintance with the modern European art movement and some of his pictures of that period are reminiscent of Piccasso and Soffici (*The Art of Jamini Ray*, Centenary Volume, 1987, p. 7).
[13]Mode, Heinz & Chandra, Subodh, *Indian Folk Art*, pls. 84, 97, New York, 1985; cf. pl. Crucifixion, Centenary volume. 1987.
[14]*Desh* (Bengali), 11th April, Calcutta, 1987.

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DESCRIPTIONS OF ILLUSTRATIONS

Pl. I

This painting representing paddy cultivation and the farmer done in water colour in wash technique seems to be the early work of Jamini Ray. Jamini Ray had special predilection for village cultivators and village craftsmen and here he has vividly depicted the hardship and labour of the farmer and the animal in tilling the soil. A stretch of blue water is at the background. Reflection of the farmer and the bull is shown in front on a small patch of water. Except the red covering of the farmer the tonal effect of the painting is soft. Pencil drawing is done after applying colour in wash technique. The painting is signed.

Pl. II

Jamini Ray is famous for making realistic portraits in oil with skill and vigour and highlighting the main characteristics. This bust portrait of Harakumar Sarkar, uncle of well-known historian Sir Jadunath Sarkar was done from a photograph at Rajshahi. Due to the dark varnish and crack the colour and physical features of the portrait were not distinct. But after restoration it regained its own vitality and characteristic features. The expression of the eyes as well as sharp nose and moustache specially draw our attention. This painting was executed by the artist around 1939 which proves that Jamini Ray continued to paint in oil in Western Academic Technique simultaneously with his painting in folk art tradition. The painting is signed.

Pl. III

The painting of mother in thick brush lines is drawn after *Kalighat Pat* style. She is represented seated, wearing red bordered white sari. To accentuate roundness and volume in the flat composition double line of thick clear brush strokes and light tone of yellow colour are used in the background. The most important feature of this painting is the bold eloquent brush strokes in dark and soft grey colour and the minimum economy of lines expressing the artist's amazing mastary of the brush. This simplification of form with sharp firm outline and sweeping curves exemplify that Jamini Ray was influenced by *Kalighat Pat* both in form and content. The delineation of face in profile with sharp nose, bowshaped eyebrow, red swollen lips, small tuft of hair near the ear and above all the soft drooping pose express a rhythmic beauty manifesting the true spirit of village woman. The painting is signed and done in tempera.

Pl. IV

This painting represents a tribal woman with pitcher, one of the favourite subjects of Jamini Ray. The entire composition is a symphony of warm colours in yellow, dark red, golden red, blue, black, and green and white. But the application of colour is done judiciously to impart freshness and vitality in the painting. The woman with her dark reddish body, golden coloured Sari with flowing veil, bright white eyes with simple water pitcher on the waist set against warm yellow background, reflect simplicity of design and lyrical refinement. The lower cylindrical portion of the figure with triangular end portion of the sari is balanced with oval medallion which is nothing but the attractive veil of the Sari over the head forming a sort of frame. While the right hand is raised in circulatory movement, the left hand is lowered down on the brown oval pitcher and the entire figure with its simple form recall to our mind the earthen clay dolls of Bengal. The only decorative designs are simple brush strokes and spots in white red, yellow, green brown and blue. The painting is signed and done in tempera.

Pl. V

Like crucifixion, the flight to Egypt is another favourite subject of Jamini Ray. In order to save Jesus from the killing of king Herod, Joseph, Mary and Jesus fled to Egypt from Bethlehem. Jamini Ray represented this touching biblical story with bold lines, simple details and subdued colour treatment, visualising a happy integration of European themes with indigenous technique. Here Mary is represented wearing a red gown with Jesus on her lap and seated on a white horse, while Joseph is standing as groom of the horse. The simple exaggerated form of the horse occupying almost the entire length of the painting has been delineated to project it from the soft brownish background. The simplicity of the form and the colour composition have great similarity with the Orissan *pat* and painted dolls and toys of Bengal. The artist has infused light in the painting by the use of yellow tint on the faces and white in the eyes. The signature of the artist has been used as motif against dark brown background in conformity with the angular designs in white and red in the upper border. It is painted in tempera.

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Pl. VI

Jamini Ray illustrated the scenes of the *Ramayana* in his own style of grand simplicity and rhythmic lines. In this painting of golden deer (Marich) episode Rama and Sita are represented seated in a hut, a simple dochala architecture of Bengal while Lakshmana standing outside with long bow and arrows. All the figures are shown in frontal attitude with faces in profile, a characteristic feature of Egyptian art. The golden deer Marich is depicted standing majestically on the semicircles symbolising hills of Orissan *pat* and turning its face towards Rama and Sita. The entire theme is delineated against a pink background with Rama in blue and Sita and Lakshmana in yellowish colour. The golden deer is represented in yellowish brown with spots and vivid line of modelling in white. The painting is signed and done in tempera.

Pl. VII

Of the different phases of experiments made by Jamini Ray to evolve a new personal idiom in form and colour, one of the phases was to reproduce the effect of Byzantine mosaics on his paintings. Painting of Mosaic consisting of cubes of marble and other coloured stones and gilded glass was largely used for mural decoration in Byzantine times. To reproduce the effect of mosaic on his painting he introduced a new technique. The painting of drummer in our collection standing with the pose of striking drum is noteworthy both for its formal quality and mosaic technique. The figure of drummer is a combination of elliptical, vertical, horizontal and angular forms and the entire structure is brought into harmonious whole with bright colour combination in the technique of mosaic decoration in blue, yellow, white, red and green coloured spots. The various coloured dots no doubt impart a brilliancy on the painting reflecting an air of mystery around the figure. The structural quality of the figure is further heightened by the application of dissonant colours. The painting is done in tempera and is signed.

Pl. VIII

The thematic content of many of the paintings of Jamini Ray has been derived from folk dolls and toys. This painting representing two women with folded hands has been derived from the painted wooden female dolls of the villages of Bengal. These wooden dolls are also called mummy dolls as the general outline of the form and decoration bears striking resemblance with the Egyptian mummy. Though the figures show a harmony of geometrical designs with colours yet the simple, naive quality of the wooden dolls are lost and replaced by a sophistication and more affiliation to Egyptian mummy. Of the two dolls, one is painted in warm yellow, blue and dark colour while the other is depicted with softer tonality of orange, soft green and dark red. Black is used for outline and geometrical decoration. Painting is done in tempera and is signed.

Pl. IX

The crucifixion of Jesus is pai ted on cloth. The Christ of Jamini Roy is a synthesis of divine and human character. Here Christ is represented with strong shoulder, short body, two nailed large red palms and the large face with projected eyes in the convention of folk art. As a whole the entire composition of Christ, particularly the face and the up-aised red plams have close affinity with the Jagannatha *pata* painting of Puri and the tribal *pata* of Bengal.

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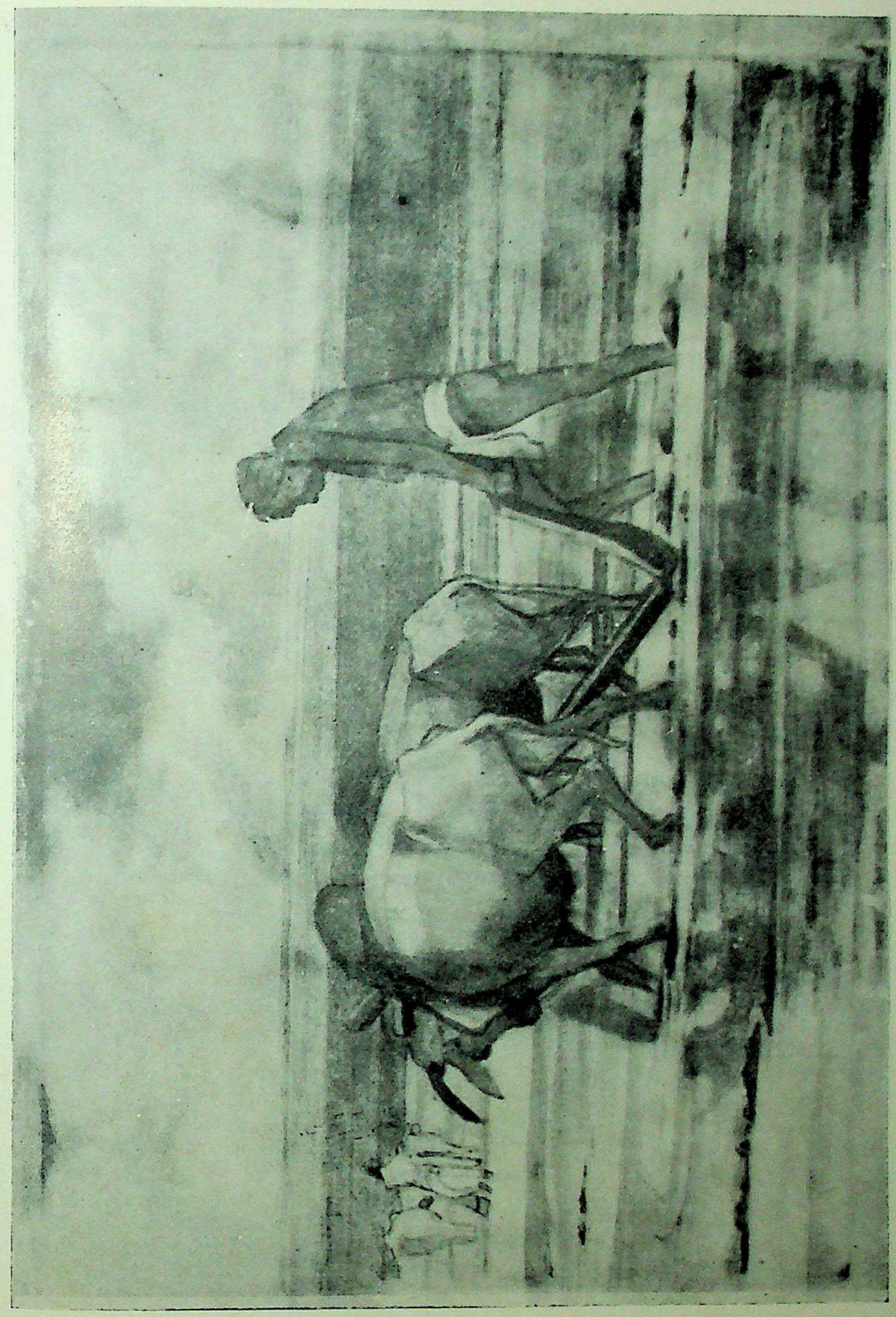

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PLATE II

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PLATE IV

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PLATE V

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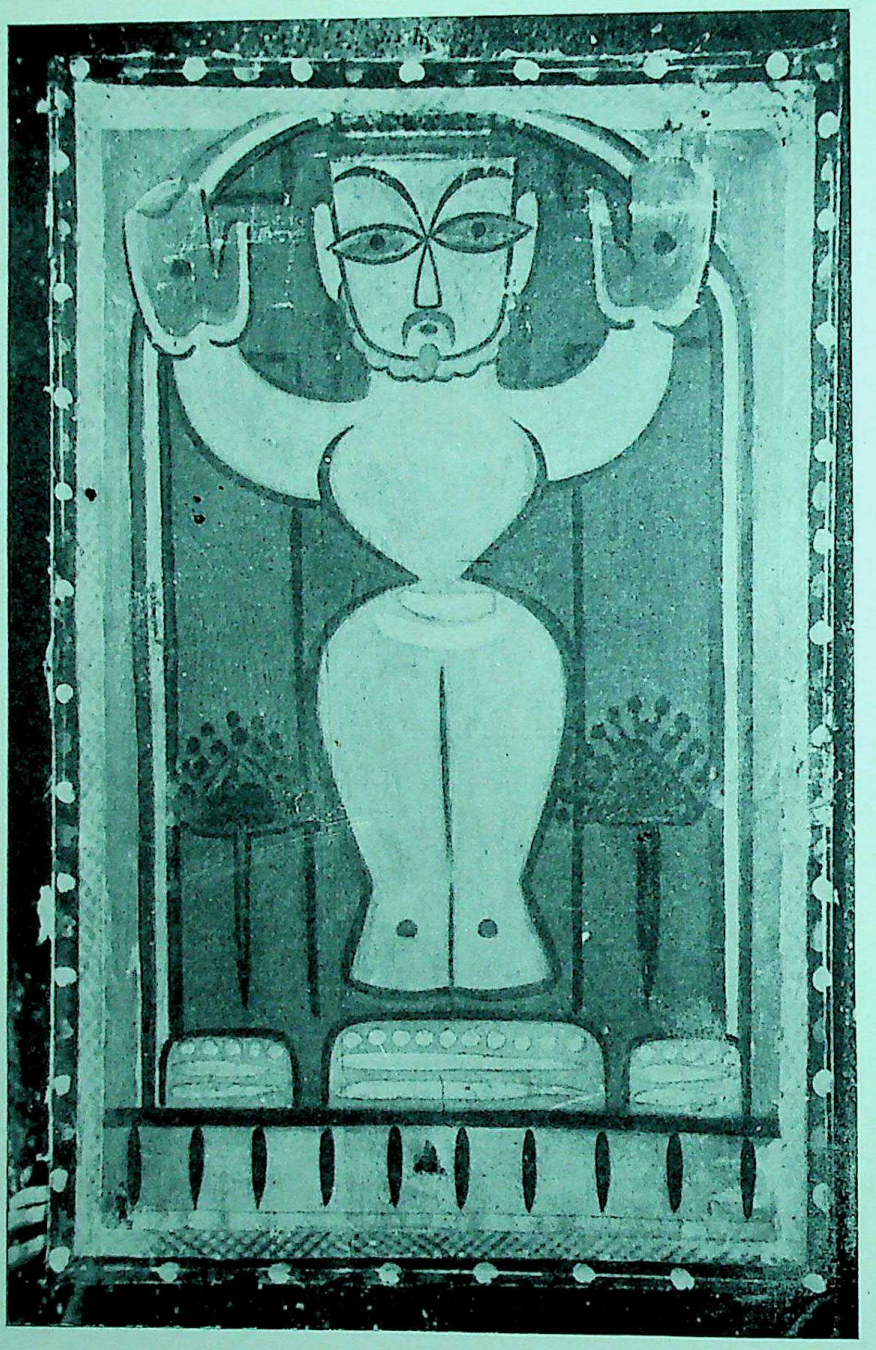
PLATE IX



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MUSEUMS : DEAD OR ALIVE ?

STEPHEN INGLIS

(Reflections on the "Workshop on Museums", October 20th & 21st 1986, held at the Madras Museum, Madras, India)

A group of Lambadi, a nomadic Indian tribe, enter the Ethnology Gallery of the Madras Museum. Their thickly embroidered clothing and heavy jewelry contrast with thes imple clothes of other visitors, but their purpose is the same, to take a relaxing stroll through the cool corridors of this old public building, view some ancient objects, and perhaps picnic under the shady trees of the grounds. Slowly they congregate before a single exhibit-case and their relaxed banter becomes more earnest. What they see is surprising and strangely disturbing among the relics of the past; there is a mannequin dressed in clothing and ornaments exactly like their own and labelled "Lambadi".

This is probably a repetition of similar encounters over the decades since the exhibit was set up, but it serves to focus attention on an issue which seemed to pervade the Museum Workshop which was in progress in an adjacent building while the Lambadi were examining themselves under glass. The issue is the popular image of a museum as a static institution which simply stores remains of the dead and gone, an image which museum professionals everywhere struggle against as they try to secure funding to do research, continue collections development, create exhibitions and arrange public programmes, in short, to do anything beyond what is necessary to provide security and keep the artifacts dusted.

The subjects of the workshop sessions, "Design and Display" and "Reaching out to the Public" certainly reflect current preoccupations of museum professionals throughout the world, yet for the representatives of 30 museums in South India as well as delegates from Madras, Ahmedabad, Lucknow, London and Ottawa, there was an underlying feeling that the common connotation of the word "museum" has itself become a stumbling block to museum growth and development.

The institution which so ably hosted the workshop brings the problem into sharp focus. The Madras Museum, founded in 18th century, is one of the most venerable museum in the world. Its galleries, many arranged according to typologies established before the turn of the century, have a tomb-like quality. The long rows of stuffed animals, stretched skins and specimens in bottles in the Biology wing, for example, set a tone which is echoed from the line-ups of carved stone images to the empty eyes of the Lambadi mannequins. South Indian villagers on bus tours, who are likely to see

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both the Zoo and Museum during a day in Madras, refer in Tamil to the former as the "live college" and to the latter as the "dead college". The Vice-Chancellor of Madras University, Dr. B. B. Sundaresan inadvertently echoed this perception when he chose, as the subject of his Museum Workshop inauguration speech, the importance of a game sanctuary which he had recently visited.

Unfortunately for museums, their exhibits show few "signs of life", and funding agencies, whether public or private, often seem to feel that they need simply be maintained, if that. Dr. Harinarayana, Director of the Madras Museum made the point that museums are lower than libraries on government funding priority lists. At least library collections circulate on a regular basis!

For curators of many of the smaller district museums who attended the workshop, the popularly perceived inertia of museums has led to a situation in which they are limited to the role of custodians. Their institutions may be looked at by the government as simply a means to distribute salaries in a uncontraversial way. One small museum in a district town has a staff of nineteen and virtually the entire annual budget goes to salaries; there is little left over for programmes or improvements. Even more of a barrier to the move toward better display and increased public programming is the tendancy to use museum jobs as political appointments. An institution which is perceived as a tranquil pool in the rushing stream of life is likely to attract managers who are either in a temporary holding pattern or about to land for good.

This all boils down to the question of who the museum serves. For most people, there is a notion that the major beneficiary of museums is posterity. Ironically, that leaves objects of the past serving people of the future; the present has to take care of itself.

Participants in the workshop sessions were anxious to discuss methods of injecting more lively programming into their institutions and the reactions to the sessions were positive. Yet we all left with the sobering conviction that although curators can design museum programmes which are vital, ongoing and relevant to the visiting public, the initial task is to convince administrators, funding authorities and the public they serve that such programmes are appropriate to a museum's role. The modern museum has the potential to become a cultural centre where people learn as much about themselves as they do about their predecessors—where the Lambadis would not be puzzled to find themselves represented. India with its vast array of traditional forms of cultural communication and growing expertise in modern communication technologies is better equipped than most countries to use museums and museum collections to enliven, stimulate and generate experience and knowledge. It will take some getting used to, but we are all involved in a process by which museums of the future may bring to mind the busy exchange of a marketplace rather than the hollow ring of a tomb.

Note: Stephen Inglis is a Canadian anthropologist who has specialized in art and ethnology. He completed a programme in Tamil language and civilization at Madurai-Kamaraj University (Tamil Nadu) and an M.A. in museology at Calcutta University. His doctoral research was a study of the social organization of potters in Madurai and Ramanathapuram Districts of Tamil Nadu. Dr. Inglis is currently curator of the South and West Asia programme at the Museum of Civilization, Ottawa, Canada.

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ARCHAEOLOGY GALLERY—AN APPROACH TO APPRECIATE MUSEUM EXHIBITS

J. R. HALDAR

THE concept of museum is developing day by day. The museologists and museum personnel are engaged in defining museum elaborately in the context of the development of society in various fronts. However, the museum has now been considered an important institution in the society. The educationists, the psychologists and the social reformers are taking interesting part in appreciating museum exhibits in the light of three principal motives of the visitors, *viz.*, (*i*) *aesthetic*, 'the wish to experience beauty'; (*ii*) *romantic* or escapist, 'the urge to leave the everyday world for a short time'; and (*iii*) *intellectual*, 'the wish to satisfy a certain thirst for knowledge'. Therefore the museum planners and exhibit specialists should try to make an object into such an exhibit which can satisfy the three motives of the visitors. In respect of the third motive, the educators in the museum have become more adventurous than those of schools and colleges because they can utilise museum environment as favourable to learning.

Now-a-days almost all the big museums of the world have set up Education Units which appoint museum lecturers who try to disseminate education to the public by explaining museum exhibits to the best of their knowledge and intelligence. However, some museum experts are of opinion that museum lecturers should impart education in such a way that visitors can follow an approach rightly in appreciating museum exhibits correctly and successfully. Sri S. M. Bhattacharya[1] points out that a museum lecturer 'should have the capacity to assess the receptivity of the listners on the spot and to decide where he should over-simplify or elaborate the subject of discussion'. Sri Bhattacharya puts stresses on 'psychological approach of a lecturer' to the visitor. The study of visitors' psychology will help the lecturers to guide visitors in a logical manner so that visitors' reaction to the educational experience within the museum may be examined correctly. In consequence, the museum authorities will be able to evaluate the extent of fruition of educational efforts in the museum and to establish a necessary link between present practice and even better and more effective practice[2] of imparting education to the public.

[1] *11th All India Museums' Camp*, Indian Museum, Calcutta, 1976, p. 25.
[2] Brooks and Vernon (see 'A study of Children's Interests and Comprehension at a Science Museum' in *British Journal of Psychology*, Vol. 47, 1956, p. 182) state that the museum for Children should intimately be bound up with child psychology.

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Lothar P. Witteborg[3] of the American Museum of Natural History says that 'the primary purpose and function of a museum and its exhibits is to educate' people. A UNESCO Journal[4] says, 'By means of the objects which it exhibits, the Museum presents an over-all view of the different stages in the evolution of a people's thinking and achievements so as to evoke memories and create a new awareness of the past'. In order to make success of such a great and noble purpose of the museum some suitable guidelines should be framed, on which lecturers can lay emphasis in showing round the following types of visitors in the archaeology gallery—(1) children aged 6 to 10 years, (2-4) students from secondary, undergraduate and post-graduate classes and (5-6) literate and illiterate visitors from urban and rural areas.

Ella Martin[5] says that collections of authentic objects by a museum can 'invite discovery and pull together the threads of what is known'. According to him, 'the visitor is urged to see what he knows, to know what he sees; in the process he may discover he knows more than he knew'. The children are inquisitive in nature; they want to know in detail about what they see; they put questions to their elders and thus they learn much. So the children should be given necessary facilities to play their role of a discoverer in the museum. The museum lecturers should guide them in the galleries in keeping with the view of Mr. Martin and see that natural and inquisitive instinct of a child is awaken to such extent that makes him/her important person in the society. It is better to let them say where they are in the galleries and what they are seeing. When they will be absorbed in their work of exploration, they should be assigned to add something valuable information to their knowledge.

It is generally admitted that the children are soft in nature. They should be guided in such a way that they are not taxed to concentrate their mind on a particular object. They are to be brought slowly without pressures and be given enough pleasure to understand historical exhibits. If a museum lecturer observes that some of the students are interested in an exhibit, he should allow them to investigate it and to explore as much as possible by putting question to him. In this way the museum can generate a spark of interest to the students and help them to explore new things and also to encourage them to study further. If a student is stimulated in such a manner, it is to be assumed that the purpose of a museum has been successful.

The students coming in large group are often found inattentive. So the lecturers should see as to how their attention may be drawn to the exhibits. They should make their speech intelligible and pleasure producing so that the students can listen to them attentively and try to learn something from the galleries. In course of their explanation of exhibits, lecturers should also see whether the students are grasping knowledge from their lectures. They should make a healthy conversation with the students and put questions to them on their lectures in a very pleasant and sympathetic manner with smiling face as if each of their questions becomes an ornamental exhibit on their visit.

The children up to 10 years of age are always connected with nature. They like to play with natural things and animals and become happy to see them here and there. So when they come to the archaeology gallery they should be guided to see the depiction of different kinds of beasts, trees and human beings in different kinds of sculptures so

[3]Hudson, Kenneth, *Museums for the 1980s, A survey of World Trends*, London, 1977, p. 9.
[4]*Museum*, UNESCO, Vol. XXVIII, No. 3, 1976, p. 145.
[5]*Museum News*, Vol. 46, No. 2, 1967-68, p. 32.

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that they are interested to visit museum again and again. The lion capital of Asoka from Sarnath, Bharhut Stupa, sculptures from Gandhara, mediaeval sculptures, coins, etc. will no doubt help them to enjoy enough pleasure. And in the midst of such pleasure they will learn many things about India's past. They will be happy to see the figures of horse, lion, bull and elephant on the Asokan capital from Sarnath. Here they may be curious to know why Asoka kept these animals in the capital. If they acquire knowledge beforehand from teachers or parents about the life of the Buddha and Asoka, they may find out the importance of carving out the figures of those animals in the Asokan capital. So a museum lecturer should see whether the children have already acquired knowledge about Buddhism and Asoka, the great patron of it. If they know, they should be asked to explain why the figures of animals were carved out in the Asokan capitals. If they do not know, the lecturers should relate to them the life of the Buddha and Asoka in a pleasant way as if they are hearing stories of mythological kings and queens at the lap of their grandmothers. In this connection it may be noted that the lecture of a lecturer should be in that form which can transform the elements relating to natural science depicted on sculptures into real ones. However, the children should be given chance to discover the cause why Asoka included animal figures in his capital. In this way the children will get help to develop their natural inquisitiveness and also to sharpen their brain for discovery.

The Bharhut Stupa contains depiction of several Jātaka stories which no doubt help the students of all classes to get pleasure as well as to learn noble ideals followed by the Buddha as Bodhisatva. For example the *Mahākapi Jātaka* may encourage the students from infant classes and emotional students from secondary and under-graduate classes to be benevolent because the story teaches as to how one can rescue his neighbours from danger by sacrificing his own life. Therefore the lecturer can tell such story as the best story teller and as the best teacher by injecting into the minds of the growing children high ideals of the Buddha depicted in the sculptures.

The students from secondary and under graduate classes are senior to those of infant classes. That is why some special characteristics develop among them. They have to pass an emotional period during their adoloscent age. They are generally imbued with some ideals they learn from books or from lessons given to them by their teachers or idealistic people including saints. It is also noticed that some ideals which the students learn during their adoloscent period influence them in later period to apply them in their daily life in making their individual and collective life better in the society. Thus the educative ideals make them good human beings and cultured persons as well as useful members of a cultured society so that they can possess an integrated and all rounded personality and earn their livelihood in a proper way. From this point of view it is interesting to note that the archaeology gallery can help lecturers to transmit to this group of students certain early Indian ideals which can make them perfect citizens in the society. Therefore the lecturers of this gallery have to prepare easy and meaningful talks for the students regarding any idealistic exhibit displayed in the gallery.

The visitors' attitude study shows as to how the students aged from 14 years to 20 years react on the question whether early Indian ideals emitted through the sculptures exhibited in the museum will make them perfect citizen to build our society in such a way that we can live in peace and harmony. A large number of students were influenced by the lectures delivered in the galleries and were delighted to have an idea that early Indian ideal cannot be neglected. It is so developed that it should be studied minutely

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and carefully so as to enable one to feel proud about one's country and her thought. The students from schools and colleges state that they should have an idea about early Indian culture so that they can understand whether they have made more progress materially and spiritually than their ancestors. They hold an opinion that society in the past was so glorious and disciplined that they can get much help from this to make their present society better. It is realised that the students should be given enough scope in the galleries so as to enable them to understand at least some aspects of Indian culture.

In order to guide an adult visitor successfully it is better to know first his educational attainment, occupation, area of living (city or village), etc. and also to see whether his visit to the gallery is for the first time. This will help a lecturer to assess the receptivity of a visitor and to decide how he should guide him in the gallery. The educated visitors from urban and rural areas holding occupations of high order generally possess some idea about Indian culture, although their subjects of study are different. They want to add more information to their knowledge. That is why they try to listen to a lecturer attentively and put questions to him on different aspects of Indian culture. In this case the lecturers will have not to face much difficulties to deliver their lectures to their own satisfaction and to answer all of the questions put by the educated visitors with arguments and evidences.

The uneducated visitors from urban and rural areas feel shy and fear and want to visit the museum with companions. A large number of visitors belonging to this group possess knowledge of Indian mythology to some extent; but they do not know philosophical and idealistic aspects of Indian religion. They come to the archaeology gallery and pay homage to the feet of the Hindu divinities. Although it is difficult to tell them regarding history of the evolution of Indian religion and philosophy with a political and social background, as they are devotees they may be taught evolution of religion by the process of telling a story of devotion. It is noticed that uneducated people are interested in listening to mythological stories. The lecturers may impart to them knowledge about history of Indian religion and its significant ideals in the form of stories of different gods and goddesses.

The visitors from India and abroad are astonished to see in the galleries different types of sculptures which are no doubt the evidences of marvellous work of the early Indian sculptors and architects. The uneducated persons often feel proud of the achievements made by their ancestors when they listen to lectures. So they may be supplied with information how cultural contact was made between India and abroad, for which they will also feel proud. The receptivity of the uneducated persons may certainly be insufficient to absorb a detailed knowledge about Indian history and culture. But it is always to be remembered that museum is an important audio-visual education centre to educate common people. Therefore the museums should be planned and arranged in such a way that casual and uneducated visitors or those educated persons who are not expert in a particular section where they are paying their visit may realise their interest. They may not understand the exhibits; but they should be guided in a way that they can realise some truth of the exhibits and may feel at every turn a challenge to their curiosity, accompanied by means of gratifying the exhibits. They should be given intelligible and interesting talk on the basis of their receptivity by a lecturer so that they can go home with awakened mind and enlarged experience not merely with a headache. The visitors' behaviour study shows that most of the uneducated visitors return with a good idea about Indian culture depicted in sculptures and inscriptions in the archaeology gallery of the Museum.

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STORAGE AND DOCUMENTATION OF ANTHROPOLOGICAL SPECIMENS

ARUN KR. CHATTERJEE

BEFORE we discuss about the problems of storing and documentation of the anthropological specimens in detail let me explain about the characteristics of anthropological objects and their mode of acquisition otherwise the root of the problem will be unexplored.

Anthropological specimens are mainly made of organic materials. Typologically they can be broadly classified in the following major types such as (1) Agricultural Implements, (2) Domestic Implements, (3) Fishing-Implements, (4) Hunting Implements, (5) Arms and Weapons, (6) Dress and Head Gears, (7) Ornaments, (8) Musical Instruments, (9) Pottery, (10) Narcotics, (11) Travel and Transport, (12) Machine & Tools, (13) Mask & Effigy, (14) Magico-Religious Articles, (15) Toys, (16) Art Objects, (17) Miscellaneous.

From the name of the each type of the specimens it can be easily imagined that the size and shape of those specimens are of various types and nature of the materials by which those specimens are prepared. Such as fishing implements of different varieties are mainly made of bamboo and cane stripes, sometime bones and iron pieces can also be found to be used. Arms and weapons are mainly made of wood and iron we find raw jute, cotton, silk, feather and cane, leather etc. have been used for making dress and head gear. Ornaments are mainly made of iron, bel-metal, brass, lead, Ivory lac, cane etc. Domestic implements are mainly made of bel-metal, brass, wood, bamboo, leafs of the tree, cocoanut shell, iron etc. Agricultural implements are mainly made of wood and iron, basketry and narcotic implements and implements under the category of travel and transport, machine and tools are mainly made of wood, iron and bamboo. So considering the various types of materials and volumes of the anthropological specimens it can be easily ascertained that the proper up-keepment of these specimens is a very difficult job to a Curator.

Before we think in detail for the proper storing of the multi-ferious types of the anthropological specimens we should be well-versed how those specimens are being acquisitioned by a museum. The first source as we know is the *process of gift or exchange and purchase.* The next source is the *field collection.* Most of the problems arise when we acquire specimen through the process of *gift, exchange and purchase.* When some specimens are received as gift or by exchange or by purchase, in 90% cases no adequate information

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can be supplied by the person or by the institution from whom purchase, exchange or gift of the specimens have been made. It is known to us that Anthropological specimens without adequate information are as useless as a lump of clay. To get perfect Techno-Socio-Economic informations about each anthropological specimens field collection is essential for the Anthropological Section of a museum. Field collectors should be well prepared intelectually and materially before he starts for collection strip. He should also know about the problems of space for keeping the collected specimens and also for their preservation. If the collected specimens is in fragile condition, durability of those specimens cannot be enhanced by the proper chemical treatment and if those specimens are very large and voluminous which cannot be kept properly in the Reserve Collection of the Museum then those types of specimens should be collected after making proper arrangement for their storage and chemical treatment. Proper documentation of those specimens is also a problem which have no proper informations. Now this problem can be avoided if those specimens are collected through proper field work. In the field, indexing and cataloguing cannot be done properly, so tag level with minimum important information should be fixed to the specimens immediately.

Field Schedule should be duly filled up against each collected specimens in the field. If we can follow the minimum process in the field there will be no problem for recording proper information when the specimens will be brought in a museum. Documentation and preservation are related to the proper storage of the anthropological specimens. Proper storage of those specimens can only be done by proper documentation and preservation process.

If we try for proper detection of the problems of storing the anthropological specimens we have no other alternative than to think first about shortage of spaces. In the multi-purpose museum like Indian Museum, Calcutta and National Museum, New Delhi Reserve Collection Room of the anthropological specimens are far from the adequate. So anthropological reserve collection have been kept in the gallery by the side of the dioramas or in the bottom of the flat show-cases which is not at all safe and scientific. Inside a gallery reserve collections should not be kept. Reserve Collection Room should be provided with wooden and steel cup-boards with proper glass-door panels so that those specimens can be easily exposed to the researcher and students. Reserve Collection Room of Anthropology Section is not mere store-room rather it is a gallery which is not open to all. The system of keeping the specimens inside boxes under lock and key are not appreciated now a days due to several practical difficulties.

For better storage greater emphasis should be given on proper documentation of the anthropological specimens.

Documentation is a systematic method of collecting and recording data about museum specimens. It is a highly structured method among all types of museum work. Without proper documentation anthropological specimens loses its importance considerably. Now a days concept of a museum is changed. Museum is no longer a static institution, it is now playing a vital role in educating the people of a country. This objective can only be achieved if the specimens in the museum are documented in a scientific and systematic way. Anthropological objects have symbolic value in the culture of a community. Properly documented anthropological objects can describe the life style of a community, its technology and a contemporary accounts of its culture. Documentation of anthropological objects has some definite purpose. It helps to identify the objects and

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documented objects helps to promote research on them. Documentation work is the plinth of the research on technology and material culture.

Documentation process can be divided in two parts:—(*i*) Field documentation, (*ii*) Museum documentation. For getting detail information of an Anthropological object field schedule is used. Indian Museum, Calcutta has evolved a schedule for the collection of information of anthropological specimens which every collector is required to fill up for his specimens. Through the schedule information on museological aspects, socio-economic aspects, technological aspects and cultural aspects of each specimen can be collected in detail. The schedule is as follows:

INDIAN MUSEUM

ANTHROPOLOGY SECTION

SCHEDULE FOR THE COLLECTION OF INFORMATION OF MUSEUM SPECIMEN

A. Information on museological aspects:

1. Name of the specimen:
   (*a*) Local name: .....(*b*) English name: .....
2. Date of collection:.....
3. Name of collector:.....
4. Place of collection:
   (*a*) Village ..... (*b*) Post Office .....
   (*c*) Police Station ..... (*d*) District .....
   (*e*) State .....
5. Field collection Number: .....
6. Mode of collection: Purchase/Gift/Loan/Exchange
   (Price, terms of loan, object exchanged, terms and condition of gift)
7. Source of collection (particulars of the persons from whom collection has been made):
   (*a*) Name.....(Sex .....Age.....)
   (*b*) Caste/Tribe .....Occupation .....

B. Information on socio-economic aspects:

8. Whether the specimen was prepared by him/anybody of his family member or purchased:

9. *In case the specimen is prepared at home, particulars about the preparator, time of preparation and source of getting constituent materials:*
   (*a*) Name .....Sex .....Age .....
   (*b*) Relation with head of the family.....
   (*c*) Time of preparation:
      (*i*) Season or month .....
      (*ii*) Time of the day.....
   (*d*) Total time required for construction.....

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(*e*) Whether it is his/her professional or spare-time activity .....
(*f*) Source of procuring constituent materials.....
.....
(*g*) If purchased, their market price.....
(*h*) Approximate market value of the specimen after construction with seasonal variation if any .....
(*i*) Means of transaction .....

10. *If the specimen is purchased*:
(*a*) Source of purchase.....
(*b*) Community of person from whom purchased.....
(*c*) Price.....
(*d*) Approximate date of purchase.....

C. Information on technological aspects:

11. Brief description of specimen:
(*a*) Complete specimen (size, shape, general description)
(*b*) Different component parts (specific name of each part, its constituent material, size and shape, fittings with adjoining parts).

D. Information on cultural aspects:

12. (*a*) Primary use.....
(*b*) Secondary use.....
(*c*) Method of use.....
(*d*) Users: (*i*) Age.....
(*ii*) Sex.....
(*e*) Whether any taboo is associated with its use or not.....
(*f*) Extent of use (economic life, special life, religious life, recreational life etc.)....
.....

13. Nature of ownership.....

14. Mode of inheritance.....

15. Is there any folk-song or folk-tale associated with the specimen ?

After the field collection the schedules for every objects should be brought to the Museum along with the objects for permanent documentation process. A tag label with minimum information is also fixed to each collected specimen in the field. The tag lable is as follows:

A. INDIAN MUSEUM—Anthropology Section
Accession No.:
Name: (Obverse)
Tribe/Caste/Community:
Locality:
Description:
Location:

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B. INDIAN MUSEUM—Anthropology Section

Field Regd. No.: Serial No.:

Name:

Tribe/Caste/Community:

Place of collection: (Reverse)

Date & mode of collection:

Source:

Collector:

As soon as the anthropological specimens are brought to the Museum they are enlisted in the general Accession Register of the section along with all relevant information. The entries in the Register are made strictly as and when an objects is received. The minimum information which are recorded in the Accession Register relates to establishing the identity of the anthropological specimens (Columns of the Register) are as follows:

PROFORMA OF THE NEW ACCESSION REGISTER

ANTHROPOLOGY SECTION (May 1979)

1	2	3	4	5	6	7
Serial No.	Accession No.	Name	Brief description	Tribe/ Community	Source of acquisition	Place of acquisition

8	9	10
Date of acquisition	Mode of acquisition	Remarks

The next step of this museum documentation is the card indexing. The Index Card is prepared with a view to help the scholars. In our museum 15 cm. × 10 cm. cards are used for indexing purpose. From field schedule information against each specimen are transferred in nut-shell to the Index Card. Index Card is as follows:

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A. Index Card

(Obverse)

INDIAN MUSEUM

ANTHROPOLOGY SECTION

Accession No. .....Name & Classification.....
Tribe/Caste/Community.....Place of collection.....
General Serial No. .....
Classified listwise Serial No. .....

Name
(*a*) Collection .....
(*b*) Collector .....
Location
Gallery .....
Reserve .....
Case No. .....
Drawer / Shelf No. .....

Description

B. Negative No. .....

(Reverse)

Photograph
or
Sketch

In the next step for the permanent documentation we prepared catalogue cards 20·5 cm. × 15·5 cm. against each anthropological specimen. In the catalogue cards we record all information collected through field schedule and also all references of published work against the particular specimen. Catalogue card is as follows:

A. Catalogue Card

(Obverse)

INDIAN MUSEUM

ANTHROPOLOGY SECTION

Accession No.....General Serial No.....Classified Listwise Serial No.....
Name—English.....Local.....Hindi .....
Classification—Major group ..... Sub-group .....
Collector.....Date of Collection.....Field-expedition.....
Field Regd. No.....
Mode of Collection.....

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Locality .....
Source of Collection—
Name ..... Address .....
Community ..... Occupation .....
Community of producers..... Sex.....Occupation.....
Production season ..... Community of users.....
Users—Sex ..... Occasion of use.....
Primary use ..... Secondary use .....
Location.....Case No..... Drawer / Shelf No. .....

B. Description

(Reverse)
Reference of published work if any.....Negative No. .....

6×8 cm. Photograph or Sketch

In Indian Museum we arrange index cards on the basis of typology and on the basis of ethnic group. This type of arrangement helps us to know the number of a particular type of specimens. Such index and catalogue cards can help the scholars in a great extent.

In fine, it can be said that the problem of storing the ethnographical specimens exist almost in every museum as because the Museum buildings were not built in consultation with Museologist in anywhere in India.

In this situation by exerting our scientific knowledge arrangement should be made for proper storage and documentation of the ethnographical specimens.

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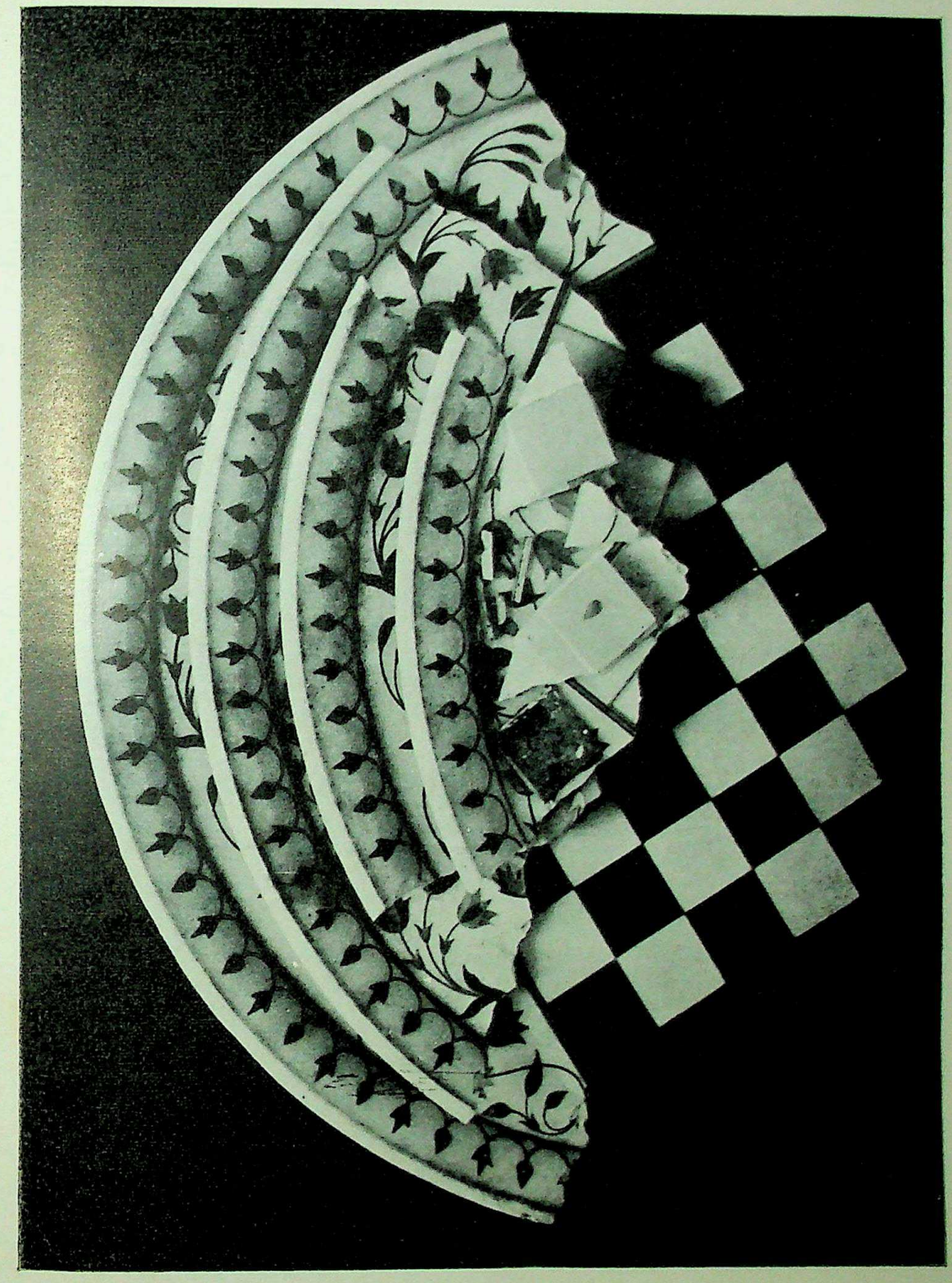

Fig. 1. Before treatment

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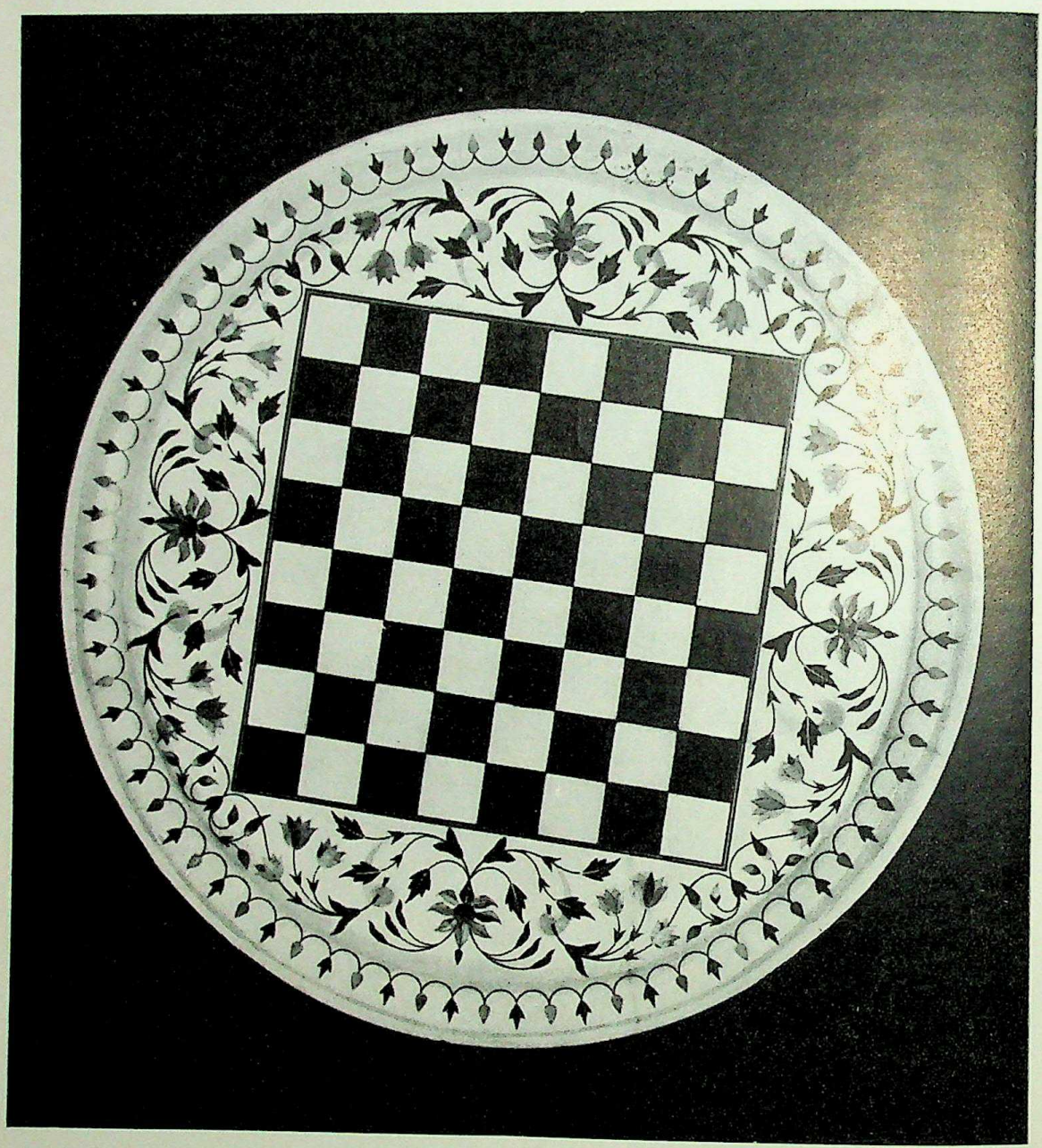

Fig. 2. After treatment

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A DECORATED MARBLE CHESS BOARD— ITS REPAIR AND RESTORATION

A. B. MITRA

Introduction

INDIAN Museum has a vast collection of various type of stone objects. Among them a beautifully decorated marble chess board was received in the conservation laboratory in broken and damaged condition. It was a round shape white marble plate having carved edge, a chess board pattern with black & white squire blocks of stones being in the middle and the multicoloured beautiful floral decoration around it. Its dimensions were diametre 47 cm., edge hight 2 cm., thickness 1 cm. and weight 3·25 kg.

Preservation Treatment

On examination it was found that there were seven fragmentary parts of the main plate and some of the decorated designed stone pieces were either broken or came out from their respective positions and some pieces found to be missings. Even some of the designed stones came out from their respective position during the cleaning operations. The nature of the fragmentary parts and some loose parts indicated that the breakage was due to some mechanical shock and not due to weakening by chemical effect. Deposition of dirt and dust particles or the object it an ugly look thereto.

It appeared that the plate was made from a single slab of good quality white marble stone. Marble is a metamorphic rock arising from the action of external agencies on limestone and became an aggregate of calcite crystals of less porosity which make them to have a good polish. The blank plate might have been made followed by transfer of drawing on the plate by the artist. About half of the thickness of the plate was scrapped out along the line of drawing and contour in order to set the decorative pieces. The coloured stones were cut exactly with the shape and size of the holes made and fitted in position with the help of plaster of paris.

After thorough dusting with soft brush the cleaning operation was undertaken with (detergent+distilled water) cleaning mixture by taking necessary precautionery measure in order to avoid any damage of plaster of paris under the design. Each fragmentary parts were treated separately with proper care. Similarly, the back side of the pieces were cleaned with a mixture of deionised water, ammonia and teepol dried in air. The front portion was cleaned with mixture of organic solvents. In this case for the bonding between marble pieces the synthetic resin is oviously recommended. Among the synthetic resin adhesive epoxy resin with their immense strength are now widely used. The

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fragmented pieces were arranged accordingly on a malinex sheet under which sand was placed to have a proper resting surface. After applying the araldite (CBA) along the line of fragmented pieces they were pressed horizontally and kept pressed by heavy weight along the edge of the plate for 24 hours. The excess was scrapped out on the next day. In the similar fashion detached floral stone pieces were fixed with araldite. The lost portion and the coloured floral design portions were restored with pigment araldite mixture using a little excess hardner and very fine with marble dust. The excess was removed with scalpel blade and polished.

Figures I and II depict the condition of the object before and after treatment of the same.

Conclusion

The most serious deterioration problem of marble stone is surface transformation to calcium sulfate due to presence of oxides of sulphur in the polluted air. Another problem is with the dust and dirt accretions which usually penetrate into the marble stone giving a different look So indoor marble objects should have a protective cover. The mishandling may lead to severe damage to the same. If it so happens in any case and damage the object all the fragmented portions whatever be its size and shape should be collected and kept for the better retention of originality during the conservation work.

Acknowledgement : The author expresses his thanks to not only Director & Dr. R. K. Mukhopadhyay, Senior Conservation Officer for encouragement but also to Shri Debesh Roy for assisting in carrying out the work successfully.

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DEVONIAN AND CARBONIFEROUS PLANT FOSSILS FROM THE KASHMIR HIMALAYA—A DISCOVERY AND ITS BEARING ON REGIONAL STRATIGRAPHY

PART I

A. K. PAL

ABSTRACT

Devonian and Carboniferous plant fossils have been brought to light from the Kashmir Himalaya. The Devonian flora, though meagre, is represented by four species belonging to Psilopsida and one species of Lycopsida in the sandstone-shale sequence at the middle part of Syringothyris Limestone. This is succeeded by another sandstone-shale sequence containing species of *Sublepidodendron* and *Lepidodendropsis* (of basal Carboniferous age). These pass upward into fossiliferous marine limestones containing *Syringothyris cuspidata*, *Productus* (*Linoproductus*) *semireticulatus*, *Caninia* sp. etc. of Lower Carboniferous age. The presence of some Devonian elements in the middle part of Syringothyris Limestone (so far considered as Lower Carboniferous in age) needed reassignment of the Devonian-Carboniferous boundary which lies within Syringothyris Limestone, at the base of *Sublepidodendron* Zone.

Lithologically, Syringothyris Limestone calls for classification of the formation into three members, *viz.*, Ainu, Kanjdori and Liwar, representing different domains of sedimentary facies of continental margin. The lowermost lithosome represented by Ainu Member comprises limestones (mostly sparrites) with few interbands of quartz-arenite probably representing palaeo-barriers in very shallow sea. The succeeding Kanjdori Member comprises mainly arenites with interbands of limestone and black shale. The sandstones are mature quartz-arenites and the limestones are calc-arenites. It possibly represents a deposit of restricted near-shore environment, most probably of lagoonal origin in which delta lobes debouched. The delta top sequence is represented by three plant bearing fluvial sandstone horizons. The fluvial litho-units may represent lateral migration of distributary channels. The Liwar Member starts with a sharp marine transgressive phase represented by fossiliferous limestone with brachiopods and corals. The fossiliferous sandstone litho-unit may represent an off-shore bar.

Syringothyris Limestone is unconformably overlain by a 500 m. thick fluvial sequence of sandstone and shale, referred by earlier workers as "Passage beds" and to be barren of fossils (Middlemiss, 1910). The present work unearthed a rich fossil flora (mainly arborescent land plants) from this sequence which is designated as Gund Formation (Pal, 1978). Seven species of lycopsids, two of pteropsids and two of sphenopsids are discovered from the sequence. It is composed of repetitive fining upward sequences of fluvial origin. The individual phase starts with very coarse-grained conglomerate which passes upward to current-bedded sandstone representing channel to inter-channel facies. The top stratum deposits are represented by black shale and carbonaceous shale representing flood plains. The repetitive nature of this sequence probably represents lateral migration of palaeo-channels in stable shelf condition. The biota consists of *Lepidodendropsis*, *Rhacopteris*, *Archaeocalamites* etc. which represent a typical *Lepidodendropsis* flora equivalent to the Dinantian of Europe. Detailed analysis of the flora indicates an Upper Tournaisian to Lower Visean age.

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Gund Formation shows evidences of uplift and erosion and is unconformably overlain by Fenestella Shale with an abundance of marine fossils in the Lower and Upper parts. These members are designated as Salar and Lihindajan Members respectively. In the middle part of Fenestella Shale a 145 m. thick sequence of sandstone and shale is recorded. This is designated as Kollur Member which contains remains of land plants like *Lepidodendron*, *Sigillaria* and *Botrychiopsis* of Westphalian age. The Salar Member represents a marine sequence with local transgressions. The succeeding Kollur Member starts with a transgressive base of freshwater regime due to withdrawal of the sea front marked by a conglomerate with erosional base. The dominant lithology is bluish grey sandy shale containing leaf and stem impressions of land plants. It may represent a vast flood plain in which small distributary channel network formed the interbedded thin arenite sequence of this Member. The lithosome of Lihindajan Member represents a marine sequence with a sharp transgressive base. The sequence appears to be the product of deposition in a very shallow epiric sea with a lot of off-shore sandy bars. The thin interbeds of carbonaceous shales in the quartz-arenite in the upper part of this member may represent a regressive phase coupled with the deposits of shallow, restricted lagoons.

A comparative study of the Devonian-Carboniferous flora of Kashmir clearly indicates their similarity with contemporary flora of other parts of the world. The present area is another site of unique illustration where admixture of northern and southern flora have taken place. As an example, a typical Euramerian flora represented by *Lepidodendron* of Westphalian age is found to exist with *Botrychiopsis* of the southern continents, within Kollur Member. This finding has a direct bearing on continental fit and spatial distribution.

Revised lithostratigraphic classification and biozonation are suggested in the light of the present findings for the Devonian-Carboniferous sequence in Kashmir Himalaya. The geological history is established with comments on palaeogeography.

Introduction

IN the north-western part of India, the valley of Kashmir is located between two arms of high mountain ranges (Pir Panjal Range in the south-west and Great Himalayan Ranges in the north-east).

Thick piles of Palaeozoic and Mesozoic strata are exposed in different parts of Kashmir basin. The folded Cambro-Jurassic sequence of Kashmir is generally believed to belong to a huge thrust sheet that has bodily moved in a south-westerly direction (from somewhere in the Zanskar area, some two hundred km. to the north-east of Kashmir) for which Wadia (1934) coined the term Kashmir nappe. This belt is homotaxial with and commonly referred to Tethyan facies with the Palaeozoic-Mesozoic sequence of Zanskar, Spiti and Niti-Byans—Sal-Sal-Painkhanda of Ladakh, H.P. and U.P. Himalaya respectively which lie to the east and south-east of Kashmir valley.

In course of the biostratigraphic study of the Kashmir Himalaya several new fossiliferous horizons were discovered and delineated. Of particular interest are the finds of Devonian and Carboniferous plant bearing horizons. The field work was commenced from 1976 and continued upto 1978. The study of plant fossils was carried out in the Central Palaeontology Laboratory and Northern Region Laboratory of the Geological Survey of India. The detailed comparative study of the fossils was carried out at Birkbeck College, University of London together with studies of the type specimens of similar flora elsewhere in the world reposited in the Geological Museum of the Geological Survey of Great Britain, British Museum (Natural History), Sedgewick Museum and the University of Paris.

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The author was awarded a Commonwealth Bursary by the Royal Society and Nuffield Foundation, London, which enabled him to study the materials from Kashmir at London in collaboration with Prof. W. G. Chaloner, FRS. This also offered an opportunity to obtain expert help of eminent palaeobotanists like Professors K. U. Leistikow of the Goethe University, R. H. Wagner, Sheffield University and W. Remy, University of Berlin who visited Prof. Chaloner's laboratory and examined the Kashmir fossils.

Records of Devonian-Carboniferous plant fossils in Kashmir

Pal (1977, 1978, 1980) discovered four plant bearing horizons in the Devonian-Carboniferous sequence in Kashmir. He described 10 taxa of lycopsids, sphenopsids and pteropsids from the Lower Carboniferous in 1980 which were also highlighted as a preliminary report in Pal and Chaloner (1979). The work of the fossils from the rest of the horizons were completed by 1979 and a write-up was prepared. However, the same could not be published earlier as the fossils were lying in London till May, 1983. The only other mention is of Gupta (1971) about doubtful impressions as "Pseudoporochnus" (?) from Kotsu area.

Meanwhile, Singh *et al.*, (1982) described eleven species including nine species described earlier by Pal (1977, 1978, 1979, 1980). The author has examined their type materials and found that most of their identifications need modification.

To summarise, the chronology of the plant fossils recorded in the Devonian and Carboniferous sequence of Kashmir is as follows:

Pal (1977, 1978, 1979)
(Published account)
Lepidodendropsis sp.
Lepidodendropsis fenestrata
Lepidodendropsis sigillarioides
Lepidodendropsis pranabii
Archaeosigillaria sp.
Cyclostigma ungeri
Cyclostigma indica
Lepidosigillaria quadrata
Rhodeopteridium tenuis
Archaeocalamites radiatus
(Unpublished GSI reports by Pal and Pal *et al.* from 1977 to 1980):
Trimerophyton sp.
Zosterophyllum sp.
Protolepidodendron sp.
Taeniocrada sp.
Singh et al. (1982)
(Published)
? *Taeniocrada* sp.
? *Protolepidodendron* sp.
Archaeosigillaria minuta?
Lepidosigillaria quadrata
Lepidodendropsis cf. *peruviana*
Lepidodendropsis fenestrata ?

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Cyclostigma cf. *pacifica* ?
Rhacopteris ovata ?
Triphyllopteris lescuriana
Rhodea cf. *subpetiolata* ?
Palmatopteris cf. *furcata* ?

The present work which is a comprehensive account of scientific exercise by the author between 1976 and 1983 where 22 taxa of Devonian—Carboniferous plant fossils are described, illustrated and discussed, with comments and necessary modifications of some of the earlier accounts. It may be mentioned that detailed systematic studies on these fossils are still in progress in the laboratories of the G.S.I. The fossils described are deposited in the Central Repository of the Geological Survey of India.

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Previous work and general Geological set up

The first geological account of Kashmir Himalaya was given by Lydekker (1883) who divided the Palaeozoics of Kashmir into Metamorphic, Panjal and Zanskar Systems. He had given an excellent account of the various lithologies in the area but his stratigraphic sequence and relative ages assigned by him to the various units was unfortunately hazarded by a bias of structural inversion and was not acceptable to the later workers. Middlemiss (1910) carried out detailed systematic work to establish the Palaeozoic sequence of the area. He provided a modified picture of the structural set up and revised Lydekker's classification introducing several new names for the litho-units like Syringothyris Limestone, Fenestella Series, Agglomeratic Slate, Panjal Volcanics etc. most of which are still in vogue. Wadia (1934) carried out detailed study of the Palaeozoic sequence particularly of the western part of Kashmir and he established the presence of definite fossiliferous Cambrian and broadly followed the nomenclatural set up introduced by Middlemiss. Since then not much work was done in the area until Gupta (1966), Fuchs and Gupta (1971) and other workers revived the interest in the Palaeozoic stratigraphy of Kashmir. Gupta (1973) introduced several new names like Gauran beds, Harpatnar beds and Naubugh beds for pre-Muth Quartzite sequence and broadly followed Middlemiss' classification for the Upper Palaeozoic sequence of the area. Shah (1972) attempted for the first time to subdivide the "Cambro-Silurian" sequence of Middlemiss into 3 units namely, Chattargul Mudstone, Lihinwan Sandstone and Morgan Shale. Pal (1976-78) subdivided the pre-Muth Quartzite sequence of the area into 6 litho-units which, however, is not in the purview of the present work.

Referring to the Devonian-Carboniferous sequences it may be mentioned that Muth Quartzites were earlier thought to represent the Devonian System, its contact with the overlying Syringothyris Limestone coinciding with the Devonian-Carboniferous boundary in the area. Greater attention was paid to the Carboniferous strata because of an abundance of fossils of marine animals and Carboniferous fossils are included in the earliest collections made from the area. Lydekker (1883) mentions that the Carboniferous strata in Kashmir are *not more than a few feet thick* and not comparable with any of the standard units of Europe*. The fossiliferous limestone and shale of Carboniferous were referred by him to the Kuling Series of Stoliczka (1866) and included it in his Zanskar System. Middlemiss (1910), however, recognises four lithological units in the areas as referable to the Carboniferous age namely, Syringothyris Limestone, "Passage beds", Fenestella Series and Agglomeratic Slate (in part). According to him, Syringothyris Limestone in the type area of Kotsu hill is over 280 m thick and Fenestella Series (including "Passage beds" which he grouped in and mapped within Fenestella Series) is more than 650 m in thickness. Though no precise figure was given, Middlemiss considered Agglomeratic Slate to be "Many thousand of feet" thick. Pal (1977, 1978) recognised a 493 m thick, freshwater cyclic sequence containing a rich fossil assemblage of land plants. This formation is sandwiched between Syringothyris Limestone at the bottom and Fenestella Shale at the top with unconformable contacts. This sequence

*"The Carboniferous of Kashmir which contains fossils characteristic of the lower part of that period, is only a few feet in thickness, and cannot, therefore, contain divisions corresponding to the European divisions of that great system, nor can it represent anything like a period of time corresponding to the enormous Carboniferous epoch of Europe" (Lydekker, 1883, p. 127).

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consisting of conglomerate, sandstone and shale was assigned by Pal (1978) to Gund Formation with an Upper Tournaisian to Lower Visean age based on the flora of this Formation (Fig. 1).

Nomenclature of the classification suggested by different workers on Carboniferous and older Palaeozoic strata in Kashmir are summarised in Table 1.

TABLE 1

Lydekker (1883)		Middlemiss (1910)	Wadia (1934)	Gupta (1966-73)	Shah (1972)	Pal (1976-78)
Panjal System (?)[1]		Panjal volcanic flows	Panjal volcanics	Panjal volcanics	Panjal volcanics	Panjal volcanics
Zanskar System	Kuling Series	Agglomeratic Slate	Agglomeratic Slate	Agglomeratic Slate	Agglomeratic Slate	Agglomeratic Slate
		Fenestella Series with "Passage beds"	Fenestella Shale	Fenestella Shale	Fenestella Shale	Fenestella Shale Gund Formation
	(Carboniferous)	Syringothyris Limestone	Syringothyris Limestone	Syringothyris Limestone	Syringothyris Limestone	Syringothyris Limestone
Panjal System	(Silurian-Cambrian)	"Muth" Quartzite	Muth Quartzite	Muth Quartzite	Muth Quartzite	Muth Quartzite
		Upper Silurian	Upper Silurian	Naubugh beds	Margan Shale	Unit F
				Harpatnar beds		Unit E
				Unfossiliferous Shale	Lihinwan Sandstone	Unit D Unit C
				Gauran beds		Unit B
				Cambrian and Ordovician strata		Unit A
METAMORPHIC SYSTEM			Salkhalas etc.	Salkhalas etc.	Salkhalas etc.	Salkhalas etc.

1. Lydekker (1883, p. 211) considers his Panjal System equivalent of Muth Series and Bhaveh Series of Spiti and assigns a Cambrian (?)-Silurian age. The Panjal volcanic flows were included by him in Panjal System while considering the System "to denote all the rocks below the Kuling Series, and above the Metamorphics".

A synthesis of works of Pal (1976, 1977, 1978), Pal and Singh (1979) and Pal and Chaloner (1979) suggest the present sequence for the Devonian-Carboniferous strata of Kashmir Himalaya (Table 2).

Recently, Srikantia and Bhargava (1983) have proposed a revised lithostratigraphic classification of the Palaeozoic sequence of the Kashmir Himalaya where they removed

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TABLE 2

Formation	Member	Lithology
AGGLOMERATIC SLATE		
	unconformity	
FENESTELLA SHALE	Lihindajan Member (425-500 m)	Massive sandstone and sandy shales containing marine animal fossils; basic sills and conglomerates.
	Kollur Member (145-150 m)	Greyish green shale, carbonaceous shale with plant fossils, sandstone, basic sills, conglomerate at base.
	Salar Member (77-150 m)	Grey, greenish and bleached shale and sandstone with marine animal fossils; 3 basic sills (1-2 m each), conglomerate at base.
	unconformity	
GUND FORMATION	(493-500 m)	Conglomerate, sandstone and shales, minor volcanics; sediments contains an abundance of plant fossils, mostly land plants.
	unconformity	
SYRINGOTHYRIS LIMESTONE	Liwar Member (200 m)	Mostly fossiliferous limestone interbedded with shale and sandstone with marine fossil invertebrates like *Syringothyris cuspidata* and corals.
	Kanjdori Member (145 m)	Sandstone and shale with *Sublepidodendron* and other fossil lycophytes, intercalations of limestone.
		Intercalations of sandstone, shale and limestone, psilophytalean plant fossils abundant in sandstone and shales; basic igneous rocks.
	Ainu Member (200 m)	Quartzitic sandstone and shale with basic intrusives; massive bedded unfossiliferous limestone.
	uncomformity	
MUTH QUARTZITE		

terms like Syringothyris Limestone, Fenestella Shale and the like and have attempted to put forward several new local names. It has been observed that they have attempted too much of splitting of lithological units and it is impossible to map litho-units coined by them on the criteria advanced by them. It is important to remember that the Code of Stratigraphic Nomenclature envisages retention of stratigraphic names which are well entrenched in the literature. Further, the statement that "fossil" name cannot be adopted for a "Formation" is incorrect as per article 4·03 of the Code of Stratigraphic Nomenclature of India (1971). In fact, the Code favours retention of such names as Fenestella Shale, Nummulitic Limestone etc. where "fossils may be used merely for descriptive purposes as any other lithological unit."

Muth Quartzite: A dominantly quartzitic sequence referred to Muth Quartzite by Middlemiss (1910) and other workers, are exposed on both southern and northern limbs of the Kotsu anticline. On the southern limb these are exposed near Nagabal, trending WNW-ESE. On the northern limb, these occur along the NW-SE trending ridge north of Hapatnar around Chorgalu and on the south of Yachha *nar* streamlet.

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These comprise pink, dirty-white and milk-white, medium and coarse-grained ortho-quartzite type of sandstone with minor shaly intercalations.

The Muth Quartzite is best developed in Guguldhar Section where it is about 897 m thick. It is much thinner in Gurdraman Section in Naubugh valley where it is only 146 m in thickness being extensively eroded away and is overlapped by Agglomeratic Slates with a profound unconformity. In Banihal Section, it is about 200 m thick.

Syringothyris Limestone: Syringothyris Limestone overlies Muth Quartzite, the contact being marked with a contrasting lithological change from pure quartzite (derivatives of orthoquartzitic type of sandstone) to dominantly calcareous sediments. No obvious change in the attitude of beds is noticed though a marked variation in the thickness of the underlying unit (i.e. Muth Quartzite) exists.

The basal part of the sequence is dominantly calcareous, comprising limestone with intercalations of quartz-arenites. Basic igneous rocks occur within the sequence, mostly parallel to the bedding. This sequence is named as Ainu Member. The succeeding sequence is dominantly arenitic with minor intercalations of limestone and black shale. There are three horizons of fluvial sandstone with plant fossils. This sequence is designated as Kanjdori Member. The overlying fossiliferous argillaceous limestones and sandstone intercalations with *Syringothyris cuspidata* and other marine fossils is named as Liwar Member. Broadly, the Syringothyris Limestone Formation represents a continental margin sequence. The lowest lithosome represented by Ainu Member comprises limestones with few interbands of quartz-arenite, most probably representing palaeobarriers in very shallow sea. The limestones are mostly sparrites and the sandstones are quartz-arenites with bioturbated structures. The Kanjdori Member comprises mainly arenites with thin interbands of limestones and black shales. The sandstones are mature quartz-arenites and the limestones are calc-arenites. It possibly represents a deposit of restricted near-shore environment and most probably of lagoonal origin in which delta lobes of palaeochannels debouched. The delta top sequence is represented by three plant bearing fluvial sandstone horizons, in different geometric levels from bottom to top. These fluvial litho-units may represent lateral migration of distributary channels. The Liwar Member starts with a sharp marine transgressive phase represented by fossiliferous limestone with brachiopods and corals. This litho-member is mainly composed of marine limestones with few interbeds of mature quartz-arenites containing fragments of marine animals. The fossiliferous sandstone litho-unit may represent an off-shore bar.

Gund Formation: Syringothyris Limestone is unconformably overlain by a sequence of conglomerate and coarse-grained sandstone intercalated with sandy shale and carbonaceous shales with minor basic sills. These are repetitive fining upward sequences. Each sequence usually begins with a conglomerate and ends with a carbonaceous shale. These beds contain abundant plant remains belonging mainly to Lycopsida, Sphenopsida and Pteropsida.

Gund Formation unconformably overlies Syringothyris Limestone with an erosional break represented by a basal conglomerate containing clasts of underlying formations. It is composed of multi-storeyed fining upward fluvial sequences. The individual cycle starts with very coarse-grained conglomerate which passes upward to current-bedded sandstone representing channel to interchannel facies. The top stratum of black shale

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and carbonaceous shale represents flood plains. The repetition of the sequence probably represents lateral migration of palaeo-channels in stable shelf condition during this period.

Fenestella Shale: The sequence overlying Gund Formation belongs to the Fenestella Shales. Though not uniformly developed in all the sections, the maximum thickness is about 600 m. The sequence begins with a conglomeratic horizon at base with basic sills. Grey, greenish and bleached shales and coarse sandstones contain an abundance of fossil marine invertebrates with several species of *Productus*, *Modiola*, *Aviculopecten* and *Fenestella*. This unit is best developed around Salar in Lidder valley where it is about 80 m thick and is named Salar Member. These are succeeded by a 150 m thick sequence of greyish green shale, bleached siltstone, carbonaceous shale, coarse sandstone with basic sills and conglomerate. This unit contains fossils of woody stems and leaf impressions of plants at two levels. This unit is best developed in Kollur section and is named Kollur Member. This is overlain by a sequence of sandstone and sandy shales with marine animal fossils. There are several conglomerate bands and basic sills in this sequence. It is named Lihindajan Member, after the type locality. The litho-unit is about 400 m thick in Lihindajan Section.

Thus, the Fenestella Shale is composed of 3 members, *viz.*, Salar Member at the base, Kollur Member in the middle and Lihindajan Member at the top. The Salar Member represents a marine sequence with local transgressions beginning with a conglomerate and the dominant lithology being a thinly bedded fossiliferous bluish-grey shale with few sandstone interbands and sills of basic rocks. The biota is dominated by fenestellid bryozoans, brachiopods and molluscs. The overlying Kollur Member starts with a transgressive base of fresh water regime due to withdrawal of sea front marked by a conglomerate with erosional base. The dominant lithology is bluish grey sandy shale containing leaf and stem impressions of land plants. It may represent a vast flood plain in which small distributary channel network formed the interbedded thin arenite sequences of this Member.

The lithosome of Lihindajan Member represents a marine sequence with a repetitive, short-termed regressive phase. It is composed of interbedded arenites and grey shales containing marine fossils, mostly bryozoans and brachiopods. The whole sequence appears to be the product of deposition in a very shallow epiric sea with lot of off-shore sandy bars. The thin interbeds of carbonaceous shales in the quartz-arenite in the upper part of this member may represent a typical regressive phase within a framework of restricted lagoons.

Agglomeratic Slate: Strata belonging to this Formation is basically the product of an episode of intermittent volcanism and, thus, being represented by conglomerates, agglomerates, shales, tuffaceous sandstones and basic rocks. These unconformably overlie Fenestella Shale with an erosional phase as evidenced by two conglomeratic horizons immediately overlying Fenestella Shale.

Descriptive Lithostratigraphy

The Devonian-Carboniferous sequence of Kashmir Himalaya is represented by 5 litho-units namely, Muth Quartzite, Syringothyris Limestone, Gund Formation, Fenestella Shale and Agglomeratic Slate (in part) in the ascending order. The lower

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and upper age limits of these systems are not very well defined in Kashmir area. The previous work so far carried out suggests that the base of Syringothyris Limestone is the base of Carboniferous and the uppermost Carboniferous is represented by the basal part of Agglomeratic Slate. Muth Quartzites were broadly considered to represent the Devonian System in the area, its lower and upper boundaries coinciding with the base and top of the Muth Quartzites. In order to study these horizons, 4 important sections—one in Banihal area and three sections in Lidder valley area—were selected where they are best exposed. The set up of these sections are described below:

1. *Banihal Area*

Banihal-Shaitan nala sections: This section consists of 5 units namely, Muth Quartzites, Syringothyris Limestone, Gund Formation, Fenestella Shale and Agglomeratic Slate (Fig. 1). Muth Quartzites are about 110 m thick in the area. Syringothyris Limestone is not very well developed here as it is in the Lidder valley and these are comparatively less fossiliferous. Syringothyris Limestone is just more than 200 m in this area. The overlying 500 m of strata are assigned to Gund Formation (Pal, 1978).

Gund Formation is best developed in Charil-Nawagam section in the Bighlari valley near Banihal. The measured stratigraphic thickness of the formation in this section is about 493 m. The Formation comprises conglomerates, gritty sandstone, white and grey argillaceous sandstone and carbonaceous shales in a cyclic sequence. These overlie Syringothyris Limestone are underlain by Fenestella Shales. The measured litho-log in the Charil-Nawagam Section is given in Text Fig. 1B.

Although there is no observable angular discordance between Gund Formation and the underlying Syringothyris Limestone, erosional surface on the latter is observed and the basal sandstone of Gund Formation is pebbly which grades upward into gritty and coarse-grained sandstone. The sequence is cyclic, each cycle beginning with a agglomerate and ending with carbonaceous shales. The conglomerate which is a clast-supported framework is constituted of pebbles and cobbles of slate, quartzite and limestone with sandy matrix in pore space. The sandstones are hard, coarse-grained with occasional pebbles, grey or white in colour and micaceous in nature. The fossils are recovered mostly from the carbonaceous shale and coarse-grained, grey, micaceous sandstones. The sandstones are locally cross stratified and with ripple marks. The cross stratification shows both in respect of their size and grain diameter.

Stratigraphically, Gund Formation broadly corresponds to the sequence referred to as "Passage beds" by Middlemiss (*op. cit.* p. 222) as he mentions: "Petrologically they (*Passage beds*) might be linked with the Fenestella series above rather than with the limestone series (Syringothyris Limestone) below inasmuch as they resemble the former in all save the lack of fossils, a disability which may even only be local and disappear with further search. For the present, however, they are placed separately as "passage beds".

However, as discussed earlier, Gund Formation constitutes a fresh water sequence with distinct lithological characteristics and biota and there appears to be little justification for the contention of Middlemiss who was in favour of grouping them in Fenestella Shales and, in fact, mapped them together.

The sequence that follows belongs to the Fenestella Shale. It indicates an erosional

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unconformity at base as marked by erosional surface and conglomerate bands at the base of the sequence. The first 77 m of the sequence is marked by green, greenish and bleached shales and coarse-grained calcareous sandstones with numerous marine fossils. This sequence has been named here Salar Member. The following 145 m represent a regressive facies with pebbly sandstone, and quartz-arenite at base and shales and carbonaceous shales with plant fossils and lacerated plant matter. This part of Fenestella Shale is designated Kollur Member. The succeeding 410 m comprises massive-bedded sandstone with shale, conglomerate and basic intrusives. Fossils of marine invertebrate animals are abundant in this sequence. This part of the sequence is best developed near Lihindajan in Lidder Valley and is named Lihindajan Member (Text Fig. 1C).

2. *Lidder Valley*

A. *Ainu-Aishmaqam section:* Basal part of Syringothyris Limestone is best exposed between Ainu and Grind *nar* on the northern limb of Kotsu anticline. The measured sequence is 230 m of sandstone, and limestone. This Unit has been designated Ainu Member. The succeeding 175 m of the sequence consists mainly of quartzitic sandstone with intercalations of shale, limestone and basic rocks and several plant fossils were found in them. This unit is best developed in Kanjdori hill near Kotsu and designated as Kanjdori Member. The overlying 200 m is dominantly calcareous comprising limestone and minor intercalations of sandstones, shale and carbonaceous shale. These are rich in fossil content, mainly of brachiopods, bivalves, crinoids and corals. These are unconformably overlain by Gund Formation, the contact being exposed on the northern bank of Grind *nar*. A considerable thickness of the upper part of the sequence is concealed under alluvial cover of the Grind *nar* streamlet. The contact with Gund Formation is often concealed except in a few outcrops where the same can be studied.

B. *Kanjdori section:* The hillock at Kanjdori constitute an isolated outcrop surrounded on all sides by the alluvium of Lidder river. The sequence exposed here lacks the control of a complete sequence with underlying and overlying strata clearly defined as it is on the main limbs of Kotsu anticline. Middlemiss (1910) has shown the presence of Muth Quartzite, Syringothyris Limestone and Fenestella Shale exposed in this hillock which forms the closure part of Kotsu anticline. Gupta (1973) mentioned the development of Devonian and Carboniferous sequence here, though in his map only Syringothyris Limestone has been shown to be exposed.

Considering the lithological set up in the main limbs of the anticline, the sequence exposed in the Kotsu hill appear to be definitely younger than Muth Quartzite, mainly because of two reasons: (1) nowhere in the areas of typical development limestone intercalated with quartzite is noted either below or within Muth Quartzite in the area, (2) the plant fossils collected from the sequence suggest Devonian-Carboniferous transition, an age much younger than what has so far been suggested for Muth Quartzite. As such the entire sequence developed in Kanjdori Hill is post-Muth, having an upper Devonian to Lower Carboniferous age and is grouped under Syringothyris Limestone within the accepted framework of litho-stratigraphy. The measured sequence is 420 m thick consisting of siliceous limestone, sandstone, shale, limestone and a thick basic sill in the lower part. The base of the sequence is not exposed being under the water level of Lidder river. Above it, the first 44 m. of strata are mostly siliceous limestone with intercalations of sandstone and shale. These are overlain by 177 m of strata containing siliceous limestone, sandstone and shale in which 3 plant horizons are noted, the basal one containing *Trimerophyton* etc., the middle containing *Protolopidodendron* and platy

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stem impressions and the upper one, a richly fossiliferous horizon, containing *Sublepidodendron* and various species of other lycopods. There is a 34 m. thick basic sill in the upper part of Kanjdori Member. This is, in turn, overlain by a 200 m of limestone with two bands (4-8 m each) of sandstone intercalated with it. The limestone is compact and is locally quarried for lime purposes. This is rich in marine invertebrate fossils (Text Fig. 1A; Fig. 3).

C. *Kollur section:* A small inlier of Syringothyris Limestone is exposed near Liwar on Bijbehara-Pahalgam road. This is overlain by Gund Formation which, in turn, is succeeded by Fenestella Shale. Fenestella Shale has an unusually large outcrop between Salar and Naigpara, a distance of about 6 km. This is, particularly so around Lihindajan where Fenestella Shale is best developed. These have been eroded away to various degrees in other places being overlapped by Agglomeratic slates. The outcrop width is more in this part as it lies on the closure of a north-westerly plunging anticline. All along the road from Salar to Naigpara it is concealed under a soil cover till near Wallarom and beyond where they are best exposed around Lihindajan-Kollur area. A plant bearing horizon within Fenestella Shale was noted here and this was measured.

The measured thickness of plant bearing Kollur Member is 145 m consisting mainly of sandstone, shale and carbonaceous shale with plant fossils in 3 levels. Within this thickness, no trace of marine fossils was noticed. The first plant horizon consists of grey, coarse-grained, thinly-bedded quartzitic sandstone, bleached siltstone and carbonaceous shale, the second being a thinly bedded carbonaceous shale which is highly fossiliferous. The third plant bed is greyish sandy shale intercalated within white quartzitic sandstone. All these horizons contain forms like *Leplidodendron ophiurus, Botrychiopsis weissiana, Sigillaria* etc. This is overlain by a sequence of over 400 m thick shaly horizon containing *Fenestella* and other marine invertebrates (Text Fig. IC; Fig. 3).

Geological History

The Palaeozoic basin of Kashmir commenced in a shallow marine niche as evinced by an abundance of marine brachiopods, trilobites, gastropods and echinoids during Cambrian. An euxinic condition was reached towards Ordovician as marked by the arrival and preponderance of graptolites. The basin gradually shallowed and the upper Silurian is again dominated by marine taxa that dwelt in shallow seas. The Muth Quartzites comprising supermature quartz-arenites of orthoquartzite type indicate stabilization of the basin during Lower Devonian. From the upper Devonian the sequence is represented by thin intercalations of mature sandstone and limestone indicating repeated fluctuations of sea level from shallow to very shallow (even terrestrial condition) and about 3 plant bearing horizons occur in the middle part of Syringothyris Limestone where a paralic condition prevailed. The Gund Formation of the Carboniferous was deposited mainly in fluvial condition as evidenced by a multi-storeyed upward fining sequence starting with channel-lag conglomerates which pass upwards to thinly bedded sandstone shale interbeds of natural levee to plant fossil bearing shales of flood plains. There are definitely five phases of deposition starting with conglomerate and terminating in carbonaceous shales. A fresh marine transgression commenced in upper Visean and continued in the Fenestella Shale regime. A paralic condition, however, returned in the Westphalian where prolific plant remains are noticed in the middle part of Fenestella Shale *i.e.*, in Kollur Member. The sedimentary history is disturbed by the close of Carboniferous where segmentation of the basin augmented volcanic explosions and deposition of volcanic rocks and volcanogenic

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sediments took place. This episode is perhaps synchronous with the Hercynian orogeny of Europe.

Fossils and Biostratigraphy

22 species of plant megafossils belonging to 16 genera are recorded and described in the present work. The following is a check-list:

Division	TRACHEOPHYTA
Class	PSILOPSIDA
Order	TRIMEROPHYTALES
Family	PSILOPHYTACEAE
Genus	*Trimerophyton* Hopping, 1956
	Trimerophyton sp.
Order	ZOSTEROPHYLLALES
Family	ZOSTEROPHYLLACEAE
Genus	*Zosterophyllum* Penhallows, 1892
	Zosterophyllum cf. *rhenanum* Krausel & Weyland, 1935
Genus	*Dawsonites* Halle, 1916
	Dawsonites sp.
Class	LYCOPSIDA
Order	PROTOLEPIDODENDRALES
Family	PROTOLEPIDODENDRACEAE
Genus	*Protolepidodendron* (Krejci, 1879, *nom. nud.*) Potonie and Bernard, 1904
	Protolepidodendron sp.
Family	SUBLEPIDODENDRACEAE
Genus	*Sublepidodendron* (Nathorst) Hirmer, 1927
	Sublepidodendron robertii (Nathorst) Chaloner, 1967
Genus	*Lepidodendropsis* Lutz, 1933
	Lepidodendropsis fenestrata Jongmans & Koopmans, 1940
	Lepidodendropsis sigillarioides Jongmans, Gothan & Darrah, 1937
	Lepidodendropsis pranabii Pal, 1978
	Lepidodendropsis sp.
Family	ARCHAEOSIGILLARIACEAE
Genus	*Archaeosigillaria* Kidston, 1901 *emend* Lacey, 1962
	Archaeosigillaria sp.
Family	CYCLOSTIGMACEAE
Genus	*Cyclostigma* Haughton, 1859
	Cyclostigma ungeri Jongmans, Gothan & Darrah, 1937
	Cyclostigna indica Pal, 1978
Family	LEPIDODENDRACEAE
Genus	*Lepidodendron* Sternherg, 1820
	Lepidodendron ophiurus Brongniart, 1828
	Lepidodendron sp.
	LEPIDODENDRALES *INCERTAE SEDIS*
Genus	*Lepidosigillaria* Krausel & Weyland, 1949
	Lepidosigillaria quadrata Danze-Corsin, 1965
	Lepidosigillaria sp.

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Class	SPHENOPSIDA
Order	EQUISETALES
Family	ARCHAEOCALAMITACEAE
Genus	*Archaeocalamites* Stur, 1875
	Archaeocalamites radiatus (Bgt.) Stur, 1875
Family	CALAMITACEAE
Genus	*Calamites* Suckow
	Calamites (*Mesocalamites*) *roemeri* Goeppert, 1850
Class	PTEROPSIDA
Order	CLADOXYLALES
Genus	*Calamophyton* Krausel & Weyland, 1928
	Calamophyton bicephalum Lecklereg & Andrews, 1960
Genus	*Rhacopteris* Schimper, 1869
	Rhacopteris cf. *circularis* Walton, 1926
Genus	*Rhodeopteridium* (al. *Rhodea* Presl., 1838) Zimmermann, 1959
	Rhodeopteridium tenuis Gothan, 1913
Genus	*Botrychiopsis* Kutz, 1895
	Botrychiopsis weissiana Kutz, 1895

After the examination of the Devonian-Carboniferous sequence in general in Lidder valley and Banihal areas and the study of fossils collected from the described sections, the following distribution table emerged (Text Fig. 2).

DISCUSSION

Syringothyris Limestone and Devonian-Carboniferous Transition in the Palaeozoic sequence of Kashmir

Syringothyris Limestone was considered by all early workers to represent the lowermost divisions of Carboniferous System and the boundary between it and Muth Quartzite was taken to coincide with Devonian-Carboniferous boundary in Kashmir. The finding of plant bearing horizons within the sequence broadly defined earlier as Syringothyris Limestone has led to the conclusion that a considerable thickness of the lower part of Syringothyris Limestone is Devonian in age as evidenced by the presence of fossils like *Trimerophyton*, *Pseudosporochnous*, *Dawsonites* and *Protolepidodendron* which are typical Devonian forms and which are not known above the Devonian anywhere in the world. Hence, the Devonian-Carboniferous boundary lies within this Formation.

This plant bearing Devonian sequence is overlain by another plant horizonwhich yielded elements like *Sublepidodendron* and other early lycophytes heralding the transition to basal Carboniferous. This is, in turn, succeeded by a marine sequence with typical fossil invertebrates like *Syringothyris cuspidata*, *Productus* (*Linoproductus*) *semireticulatus*, *Caninia* etc.

Gund Formation and its Lepidodendropsis Flora

Syringothyris Limestone is succeeded by a nearly 500 m thick sandstone—shale sequence which was designated as Gund Formation (Pal, 1977, 1978). This unit is best developed in Banihal area where the type area has been designated. In Lidder valley area also these are nearly 400 m thick and contain abundant plant fossils. In this Formation which broadly corresponds to the "*Passage beds*" of Middlemiss (1910), no marine fossils were encountered and these essentially represent a continental/coastal facies. The

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floral assemblage recovered from both Banihal and Lidder valley areas in this Formation contain typical *Lepidodendropsis*, *Lepidosigillaria*, *Archaeosigillaria*, *Cyclostigma*, *Archaeocalamites*, *Rhacopteris*, *Rhodeopteridium* etc. These represent a Lepidodendropsis flora and are of Upper Tournaisian to Lower Visean in age (Pal, 1977).

Fenestella Shale Formation: Its Marine Fauna and the plant bearing horizon in its middle part

Gund Formation is unconformably overlain by Fenestella Shale Formation which is about 650 m thick in Banihal and possibly thicker in Lidder valley. Within this Formation a thick sequence containing plant fossils was noticed and studied in the Lidder valley area which yielded a prolific flora consisting of *Lepidodendron*, *Botrychiopsis*, *Sigillaria* etc. A preliminary examination of the floral aspect indicate an upper Carboniferous age and in view of the clear Visean aspect of the marine fauna of the lower part of Fenestella Shale, a Westphalian age seems most probable for the strata containing the plant fossils. This plant bearing horizon was also traced in Banihal area. Thus, the occurrence of a plant bearing horizon in the middle part of Fenestella Shale seems to be a regional feature in Kashmir Himalaya which needs precise delineation. It may be added in this context that the plant bearing beds are mostly quartzitic and silty (bluish grey in colour) with intercalations of carbonaceous shale while the marine fossiliferous beds in the unit are dominantly shaly with minor sandy bands.

Agglomeratic Slate and the Carbo-Permian Boundary

The previous work by Nakazawa and Kapoor (1976) and other workers has shown that the basal biozone of Agglomeratic Slate Formation is of Upper Carboniferous age while the upper biozones are referable to the Permian. As such the upper limit of Carboniferous lies within this unit.

Lepidodendropsis Flora of Kashmir and the problems of continental fit

The Gund flora contains several genera which link it with typical Lepidodendropsis floras from other parts of the world; it is dominated by a number of lycopods, particularly *Lepidodendropsis*, *Lepidosigillaria*, *Archaeosigillaria* and *Cyclostigma*, together with *Archaeocalamites*, *Rhacopteris* and other sphenopterids. In these constituents the Gund flora shows significant agreement with the Early Carboniferous Lepidodendropsis flora from Europe, from the Pocono Formation of the U.S. and floras of comparable age in Peru, Ghana, Morocco, eastern Sahara and Egypt, Syria, China and western Malaysia. The common elements are shown in Table 3.

Jongmans (1952) regarded his Lepidodendropsis flora as "the flora of the older part of the Lower Carboniferous and as the transition to the Archaeopteris—Cyclostigma flora of the true Upper Devonian". Note that in the Lower Carboniferous of Geigen Hof, Bavaria, where Lutz (1933) first recognised *Lepidodendropsis hirmeri* (the type species), this genus occurs in association with *Rhacopteris* and various other sphenopterids, together with *Sphenophyllum*. Similar, more or less contemporaneous, floras are found in many parts of Europe with minor variations, such as the *Lepidodendropsis—Archaeocalamites—Rhacopteris* association of North Wales (Lacey, 1962) or the *Lepidodendropsis—Archaeocalamites—Triphyllopteris—Rhodeopteridium* association of southrn Spain Wagner, 1978. Floras of the Pocono Formation in Pennsylvania and Virginia are strikingly similar to these, and comprise various species of *Lepidodendropsis*, *Cyclostigma*, *Triphyllopteris* and other sphenopterids (Jongmans, Gothan, & Darrah, 1937). A *Lepidodendropsis—Adiantites—Fryopsis* flora is known as far north as Alaska (Chaloner, & Meyen, 1973).

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TABLE 3

Common features of the Gund flora and early Carboniferous floras found elsewhere

Fossil plants in Gund Formation	Europe (early Carboniferous)	North America (early Carboniferous)	Peru (early Carboniferous)	North & West Africa (late Devonian to early Carboniferous)	China (early Carboniferous)	Malaysia (early Carboniferous)
Lycopsida						
Archaeosigillaria sp.	*			*		
Lepidosigillaria quadrata Danze-Corsin				**		
Lepidodendropsis sp.	*	*	*	*	*	*
Lepidodendropsis sigillarioides J.G. & D.	*	**	*	*	*	*
Lepidodendropsis fenestrata Jongmans	*	*	*	**	*	*
'*Cyclostigma*' *ungeri* J.G. & D.	*	**	*	**		
Pteropsida						
Rhacopteris circularis Walton	**	*	**	*		
Rhodeopteridium tenuis Gothan	**	**			*	*
Sphenopsida						
Archaeocalamites radiatus (Bgt.) Stur	**	**	*	*	**	

**Species in common; *Genus in common.

Comparable assemblages occur on the now separate parts of the Gondwanaland mass. A *Lepidodendropsis—Cyclostigma—Triphyllopteris—Adiantites—Rhacopteris* assemblage is known from Carhuamayo in Peru (Jongmans, 1954). In Africa, *Lepidodendropsis* is reported from Ghana (Mensah & Chaloner, 1971) and from Morocco (Danze-Corsin, 1965) through Libya (Lejal-Nicol, 1976) and the eastern Sahara (Lejal-Nicol, 1968) to Egypt and Sinai (Jongmans & Koopmans, 1940; Jongmans & Heide, 1955), in association with one or more of the genera *Prelepidodendron*, *Archaeosigillaria*, *Lepidosigillaria*, *Archaeocalamites*, *Sphenopteris* and *Rhacopteris*. The early Carboniferous age attributed to Australian reports of *Archaeocalamites*, *Lepidodendron*, *Rhacopteris*, *Fryopsis* and *Adiantites* has been questioned (Rigby, 1973). In south-east Asia a *Lepidodendropsis—Sublepidodendron—Archaeocalamites—Triphyllopteris—Cardiopteris* association is known from Wutung in Kianshi Province, China (Sze, 1936; Chang, 1965). Further south, a *Lepidodendropsis—Lepidodendron—Adiantites—Rhodeopteridium* assemblage occurs in the Lower Carboniferous of western Malaysia (Asama, 1973).

In the area east of the Urals, floras occur that are characterised by several endemic genera of lycopods (*Ursodendron*, *Tomiodendron*, *Lophiodendron*) together with *Angaropteridium* and *Chacassopteris* (Vakhrameey, *et al.*, 1978). While the separation of these several Russian genera may well be justified, the general aspect of these Lower Carboniferous Angara floras is broadly comparable to contemporaneous floras from other parts of the world (Chaloner & Meyen, 1973).

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Almost all known records of *Lepidodendropsis* are Lower Carboniferous in age, apart from two species reported from the Devonian of China (Sze, 1952), and the reports by French workers of this and other lycopod genera from the Devonian of North Africa. The reports from North Africa of several genera (*Lepidodendropsis, Archaeosigillaria, Tomiodendron, Abacodendron*) in rocks of Devonian age, considerably pre-dating their first occurrence elsewhere, has led to the suggestion (Lejal-Nicol, 1975) that Africa was the centre of origin of this whole group of arborescent lycopods (Lepidodendrales *sensu lato*). Until the age of the African material can be linked more securely with reliably dated marine faunas this interpretation must be regarded as controversial.

The age of the Australian *Rhacopteris—Lepidodendropsis—Cyclostigma* flora, originally regarded (Walton, 1937), as Lower Carboniferous has more recently been reinterpreted as of Upper Carboniferous (Westphalian) age (Rigby, 1973). Such uncertainties in the age of pre-Glossopteris floras in Gondwanaland emphasise the significance of a flora such as that of the Gund Formation, in lying within a sequence containing marine faunas above it and below.

The Gund flora reported here confirms the close comparability of the Lower Carboniferous flora of northern India with that of other areas both in Gondwanaland and the (present) Northern Hemisphere. The four well-explored parts of the Gondwana block (India, South America, Africa and Australia) now prove to have had as close a floristic similarity before the Carbo-Permian glaciation, as that shown by the more intensively studied Glossopteris flora which succeeded it.

Recent palaeomagnetic data from the Silurian and Devonian of China (Irving, *et al.*, 1976), has led Keppie (1977) to divide Eastern Asia into two parts along a line through the Tien Shan-Mongol mountain belts to Vladivostock in his palaeogeographic reconstruction for the Devonian and Early Carboniferous. He was influenced in this proposal by the otherwise puzzling juxtaposition in the same latitudes of the Early Carboniferous Angara floral province with that of *Lepidodendropsis* in China. His reconstruction now places the boundary between these provinces at a palaeolatitude of approximately 35° N.

The present-day Chinese and Malaysian areas are brought in Keppie's reconstruction (Keppie, 1977) into closer proximity to Gondwanaland than generally visualised hitherto, leaving their Lepidodendropsis flora disjunct from that of the main body of Eurameria. A somewhat more westerly position for the Sino-Malaysian block, possibly lying north and west of Australia, would offer a continuity with the Lepidodendropsis floras of Africa, South America and Europe, with this newly-discovered flora in Kashmir acting as a link between the eastern and western occurrences of *Lepidodendropsis*.

The occurrences of Lepidodendropsis flora throughout the world were plotted on a palaeographical map of the Lower Carboniferous times (Fig. 2). The palaeo-reconstruction of world map by Seyfert & Sirkin (1973) was used for the purpose. It is observed that most of the localities fall on the equatorial girdle or near to it, maximum dispersal spanning between 30°S and 30°N palaeolatitudes. Exceptions are the *Lepidodendropsis* flora of India and Australia. The geographic restriction of the occurrence of *Lepidodendropsis*, and its presence in Indian and Australian rocks, suggests that these two areas (India and Australia) were logically within 30°S and 30°N latitude during Devonian-Carboniferous times.

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Concluding Remarks

The present account on newly discovered plant fossils from Devonian-Carboniferous sequences of Kashmir Himalaya not only throws a new light on litho- and biostratigraphy of the late Palaeozoics of Extra-peninsular India but also logically brings out palaeo-environmental vis-a-vis palaeogeographic history of Kashmir basin.

Presence of a new stratigraphic horizon *i.e.*, "Gund Formation" has been ascertained by the author on strong logical ground together with recognition of six new members.

Establishment of Devonian-Carboniferous boundary with respect to Syringothyris Limestone is of fundamental nature which undoubtedly eradicates earlier contradictions and incorrect assumptions.

Different subdivisions of Carboniferous System as revealed from Eurasian continents has never been tried in Indian Palaeozoic stratigraphy to match already established stratigraphic sequences like Fenestella Shale, etc. The author has not only established the passage of Syringothyris Limestone from Middle Devonian to Lower Tournaisian (Lower Carboniferous) with positioning of three members but has also been able to recognise the boundaries between Westphalian and Stephanian and also matching of a member with a subdivision of Westphalian (*i.e.* Muscovian with Kollur Member).

The most interesting aspect of this work is the finding of some Devonian elements from within so-called Syringothyris Limestone which was earlier considered as Carboniferous in age.

The most unique aspect of the present work is the discovery of *Lepidodendropsis* flora in this part of the globe which acts as a missing like between the spread of this flora from Eurameria through northern part of S. America and Africa on the one hand and Australia on the other.

The occurrences of Lepidodendropsis flora throughout the world, interestingly, is restricted between 30°S and 30°N latitudes. Exceptions are the Lepidodendropsis flora of India and Australia. The geographic restriction of occurrence of *Lepidodendropsis* and its presence in Indian and Australian rocks, suggests that these two areas (India and Australia) were logically nearer to the equatorial girdle (than litherto conceived), at least within 30°S and 30°N latitude during Devonian-Carboniferous times.

This study, therefore, has an important bearing on the concept of positioning vis-a-vis continental drifting in post or late Palaeozoic times.

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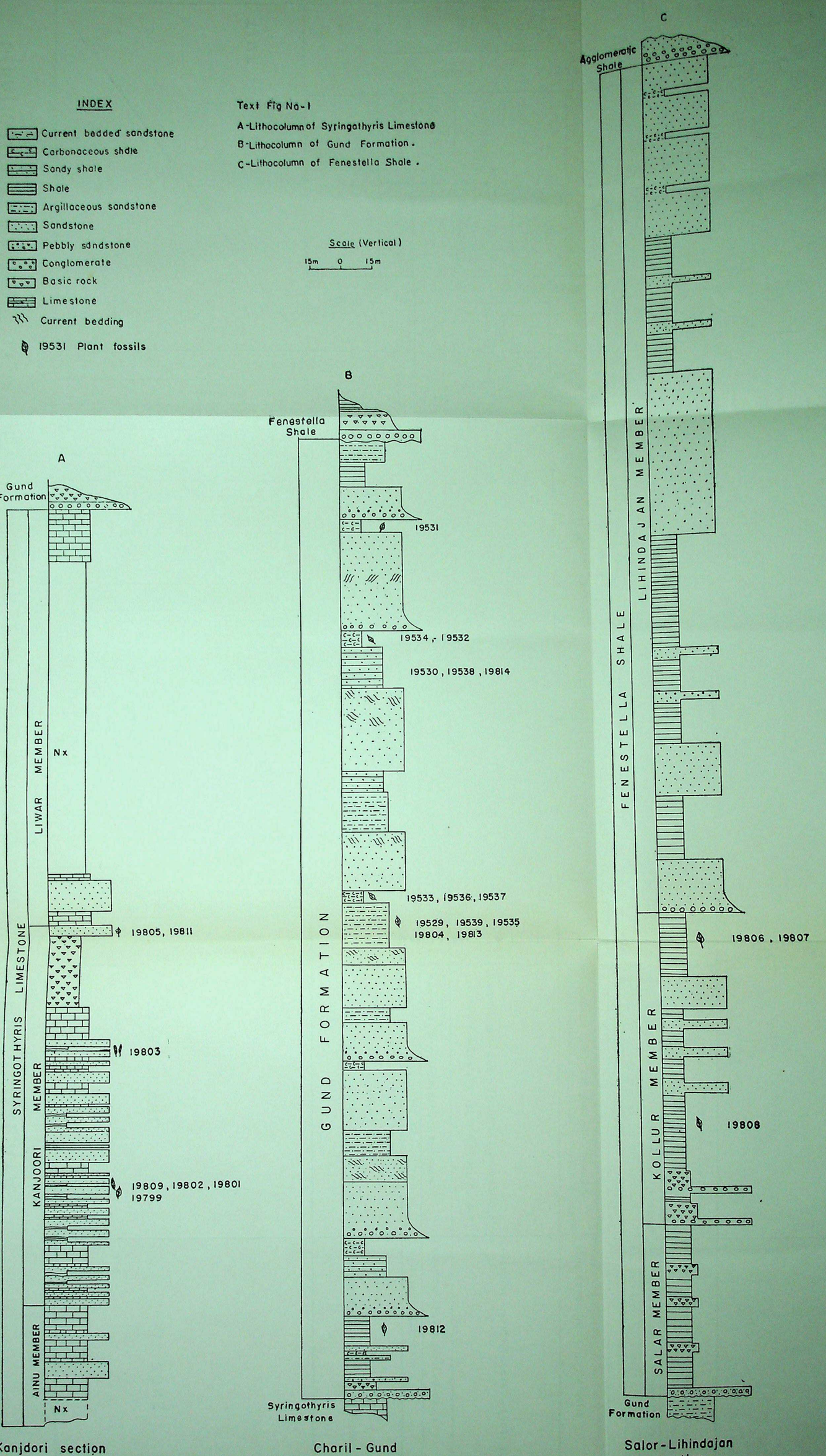

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Text Fig-2

STRATIGRAPHIC DISTRIBUTION OF DEVONIAN - CARBONIFEROUS MEGAFLORA IN KASHMIR HIMALAYA

TIME					TAXA	PLANT HORIZONS	ASSEMBLAGE	BIO - ZONE
PERMIAN				AGGLOMERATIC SLATE	Trimerophyton sp., Zosterophyllum sp., Dawsonites sp., Protolepidodendron sp., Sublepidodendron robertii, Lepidodendropsis fenestrata, Lepidodendropsis sigillaroides, Lepidodendropsis pranabii, Lepidodendropsis sp., Archaeosigillaria sp., Cyclostigma ungeri, Cyclostigma indica, Lepidodendron ophiurus, Lepidodendron sp., Lepidosigillaria quadrata, Lepidosigillaria sp., Calamophyton bicephalum, Rhacopteris cf circularis, Rhodeopteridium tenuis, Botrychiopsis weissiana, Archaeocalamites radiatus, Calamites (Mesocalamites) roemeri		*Eurydesma sp., Deltopecten, Protoretipora sp. UNFOSSILIFEROUS	*Eurydesma - Protoretipora - Deltopecten
CARBONIFEROUS	UPPER	STEPHANIAN	C	URALIAN			*Fenestella sp., Phillipsia sp.	*Fenestella - Phillipsia
			B					
			A					
	MIDDLE	WESTPHALIAN	D	MUSCOVIAN	FENESTELLA SHALE — Lihindon Member			
			C		Kollur Member	4	Lepidodendron ophiurus, Botrychiopsis weissiana	Lepidodendron - Botrychiopsis
			B					
			A	BASHKIRIAN				
		NAMURIAN	C		Salar Member		*Productus undatus, P. (Linoproductus) cora, Modiola lidarensis, Aviculopecten middlemissi,	*Productus - Aviculopecten - Fenestella
			B	NAMURIAN				
			A					
	LOWER	VISEAN			GUND FM.	3	Lepidodendropsis sigillarioides, Archaeosigillaria sp., Cyclostigma ungeri, Lepidosigillaria quadrata, Rhacopteris cf circularis, Archaeocalamites radiatus etc.	Lepidodendropsis - Rhacopteris Archaeocalamites
		TOURNAISIAN			SYRINGOTHYRIS LIMESTONE — Liwar m. Member		*Dibunophyllum briestolensis, Lophophyllum interruptum	*Dibunophyllum - Caninia
							*Syringothyris cuspidata, Productus semireticulatus,	*Syringothyris - Productus - Bispathodus
					Kanjdari Member	2	Sublepidodendron robertii, Lepidodendropsis fenestrata	Sublepidodendron - Lepidodendropsis
DEVONIAN	UPPER					1	Trimerophyton sp., Dawsonites sp., Protolepidodendron sp., Calamophyton bicephalum.	Protolepidodendron - Trimerophyton
	MIDDLE				Ainu Member		UNFOSSILIFEROUS	
	LOWER				MUTH QUARTZITE			

* Marine animal fossils

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INDIAN INSTITUTE OF TECHNOLOGY,

MADRAS - 600 036.

ADMISSION TO M.S. (Entrepreneurship) PROGRAMME

The Indian Institute of Technology, Madras, has been organising a unique Master's level programme, for Engineering and Technology graduates, leading to M.S. in Entrepreneurship. The objective of this programme is to expose the young engineers to the field of entrepreneurship development and to provide them with excellent facilities for hi-tech product development. It is tailormade for those who have an urge to start their own industries.

ELIGIBILITY : Candidates with a degree in any of the disciplines of engineering/technology or appearing for the same are eligible to apply. A minimum GATE score of 70 percentile is essential for admission.

FELLOWSHIP : Candidates admitted to the M.S. Programme are eligible for fellowship, as per the Government of India norms.

Last date for receipt of filled-in application is 24th April 1990.

Details of the course and application form can be obtained from the Centre for Industrial Consultancy & Sponsored Research, Indian Institute of Technology, Madras - 600 036 (Phone : 411386). A self-addressed stamped envelope of Rs. 1.50 is to accompany the requests for application forms.

Dean, IC & SR

ADMISSION TO M.S./Ph.D RESEARCH PROGRAMMES, JULY 1990

A. FULLTIME

1. **Ph.D. PROGRAMMES IN CHEMISTRY, MATHEMATICS, PHYSICS, HUM & SOC. SCIENCES** (Economics, German, English, History & Psychology)

MINIMUM QUALIFICATIONS : Master's degree in Science/Hum&Soc Sciences with 1st Class or minimum 60% marks (CGPA 6.5) or equivalent and having a valid GATE Score of not less than 70 percentile/obtained UGC/CSIR Fellowship tenable from the current year in the relevant areas. Master's degree in Engg/Technology with 1st class or minimum 60% marks (CGPA 6.5) or equivalent for certain areas.

2. **PH.D. AND MASTER OF SCIENCE (M.S) BY RESEARCH** in Aerospace Engg. Applied mechanics (Engg Mechanics, Fluid Mechs. Machine Dynamics, Industrial Tribology, Maintenance Engg & Management and Biomedical Engg.), Chemical Engg., Civil Engg., Computer Science & Engg., Electrical Engg, Humanities & Social Scs. (Indu.Engg. & Industrial Management; Humanities and Behavioural Scs.), Mechanical Engg., Metallurgical Engg., Ocean Engineering.

MINIMUM QUALIFICATIONS :

Ph.D. : Masters Degree in Engg/Technology with 1st Class or minimum 60% marks(CGPA 6.5) or equivalent for the Engg disciplines. Masters's degree in Science/Hum&Soc Scs with 1st class or minimum 60% marks (CGPA 6.5) or equivalent & having a valid GATE score of not less than 70 percentile/obtained UGC/CSIR Fellowship tenable from the current year.

M.S : Bachelor's degree in Engg./Technology or equivalent or Master's degree in appropriate Science/Humanities and Social Sciences with a 1st class or minimum 60% marks (CGPA 6.5) or equivalent and having a valid GATE score of not less than 70 percentile/obtained UGC/CSIR Fellowship tenable from the current year in the relevant areas.

3. **OPPORTUNITIES ALSO EXIST FOR RESEARCH WORK IN THE FOLLOWING CENTRES :**

M.S./Ph.D : F.R.P. Research Centre and Centre for Systems and Devices.

Ph.D : Centre for Bio-Sc & Bio-Technology, Mate-rials Sciences Research Centre and Regional Sophisticated Instrumentation Centre.

B. EXTERNAL REGISTRATION (M.S./PH.D.)

Sponsored candidates from R&D Establishments, Public Utility Undertakings and Industrial Units with well established R&D Units recognised by DST and those involved in research & analysis in Service Organisations like Banks, Government Departments, L.I.C etc. may be considered for admission. They must possess the minimum academic qualification as prescribed for **fulltime candidates in all respects.** However, a candidate who has secured a high 2nd class (55 % marks or CGPA 6.0) in Master's Degree exam is also eligible if his degree is of year prior to 1970, or it is in a Hum/Soc Scs subject, provided he possesses a valid GATE score/UGC/CSIR Fellowship **tenable from the current year.**

UPPER AGE LIMIT : For Ph.D. - 45 years, For M.S. - 35 years. They are not eligible for Institute scholarship. Faculty are not eligible to apply under this scheme.

C. GENERAL INSTRUCTIONS

1. detailed information containing areas of study/research, eligibility of candidates with different backgrounds, etc will be sent with prospectus.
2. Certain percentage of seats are served for SC/ST candidates. They are eligible for relaxation upto 5% marks in the qualifying examination.
3. Fulltime research scholars will be paid scholarship as per approved norms.

HOW TO APPLY : Application form along with detailed information may be obtained by candidates by sending a requisition containing the name & address of the candidate and mentioning clearly the course and enclosing-

a) A Bank Draft in favour of IIT Madras payable at Madras for Rs. 25/- drawn from any Nationalised Bank. No other mode of payment is acceptable. &
b) a self addressed envelope (25 cm X 15 cm). If a candidate proposes to apply for more than one Dept/Course, he should apply separately to each Dept/Course.

LAST DATE :

1. FOR RECEIPT OF REQUISITION FOR APPLICATION BY POST - 12th April, 90 (Thurs.)
2. FOR RECEIPT OF COMPLETED APPLICATIONS 24th April, 90 (Tues.)

PROBABLE DATES FOR INTERVIEW/TEST:M.S/PH.D 11th and 12th June'90.

Advt. No. F.Acd/ARU/R3/01/90-91 **Dy. Registrar (ACAD)**

ADMISSION TO 3 SEM.M.TECH (WITH SCHOLARSHIP), M.TECH (SPONSORED) AND 4 SEM.M.Sc. PROGRAMMES, FOR THE ACADEMIC YEAR 1990-91.

GENERAL

(A) **M.Tech Programmes :** In the Depts of Aerospace Engg., Applied Mechanics (Engg. Mechanics, Industrial Tribology, Maintenance Engg and Management), Chemical Engg., Civil Engg., Computer Sc and Engg., Electrical Engg., Hum. & Soc. Sci. (Industrial Management), Mech Engg., Met.Engg.(Industrial Metallurgy), Physics (Solid State Technology), and Ocean Engg.

(B) **M.Sc. Programmes :** In the Departments of Chemistry/Mathematics/Physics.

Seats are reserved for SC/ST candidates as per rules. Disciplines and areas are given in the brochure, sent along with the application forms.

MINIMUM QUALIFICATIONS FOR ADMISSION

i. **M.TECH (WITH SCHOLARSHIP):**
   (a) Bachelor's degree in Engg./Technology OR equivalent, OR a Master's degree in Science, OR a Bachelor's degree in Architecture, AND
   (b) A valid GATE score with a minimum of overall 70 (40 for SC/ST) percentile.

Candidates who have been successful in the GATE 1990 but whose results in the qualifying degree exam are yet to be declared are also eligible to apply, provided they complete all requirements for the degree latest by July 16, 1990. A candidate admitted once for M.Tech (with Scholarship) will not be eligible for admission with Scholarship at this/any other Institute on the same GATE Score.

ii. **M. TECH (SPONSORED):**
   (a) 1st Class or 60% (55% for SC/ST) marks (where class is not awarded) in the aggregate in Bachelor's degree in Engg/Tech or M.Sc. for certain areas, &
   (b) minimum 2 years (3 years for Industrial Management) professional experience (excluding training period) after graduation at the time of joining. Candidates fully sponsored on leave with full salary by Labs run by CSIR, Depts. of Atomic Energy, Space, etc., Public Sector undertaking with R&D Unit, & Private Industries recognised by DST and engaged in R&D work, are only considered. In respect of candidates sponsored for Industrial Management, they should be employed in the categories of Industries as prescribed by the Institute. Under the Sponsored Scheme students are not eligible for Institute Scholarships.

iii. **M.SC. (CHEMISTRY/MATHEMATICS/PHYSICS):**

A 1st Class or 60% marks (where class is not awarded) in the aggregate or equivalent in the Bachelor's degree in Science (Chemistry/Maths/Physics).

M.Sc. (Chem) : Only candidates with B.Sc. Chem main and Maths and Physics ancillaries or as additional mains are eligible. Candidates with no other ancillaries are eligible.

M.Sc. (Maths) : Only candidates with B.Sc Maths main are eligible to apply.

M.Sc. (Phys) : Only candidates with B.Sc. Physics main and Maths as one of ancillary subjects are eligible to apply.

Candidates with general B.Sc. are also eligible as per above norms. Those appearing for final qualifying exams are eligible to apply, provided they complete all their exams, including practical/viva, not later than July 16, 90 and are able to produce provisional certificate on the date of joining.

HOW TO APPLY : Request for application & Prospectus should be made along with a Demand Draft for Rs. 25/- drawn on State Bank of India, in favour of IIT Madras & 2 slips (5 cm X 10 cm) with applicants address in CAPITAL LETTERS, to the following :

For M.Tech (with Scholarship) - Chairman, GATE, IIT, Madras - 600 036

For M.Tech (Sponsored) and M.Sc. - Asstt. Registrar (PG), IIT, Madras - 600 036

Separate requests must be made for application forms for M.Sc. (Chemistry), M.Sc. (Maths), M.Sc. (Physics), M.Tech (Sponsored), M.Tech (with Scholarship).

LAST DATE :

FOR RECEIPT OF REQUESTS FOR FORMS : By post - 23.4.90 (Mon), At counter 3.5.90 (Thu)

FOR RECEIPT OF COMPLETED APPLICATIONS : M.Tech (with sch.) & M.Sc. 4.5.90 (Fri)

M.Tech (Sponsored) 11.5.90 (Fri)

Advt. No. F. Acad/PGU/Adv/90 **Dy. Registrar (ACAD.)**

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SKETCH GEOLOGICAL MAP OF AN AREA OF BIGHLARI VALLEY

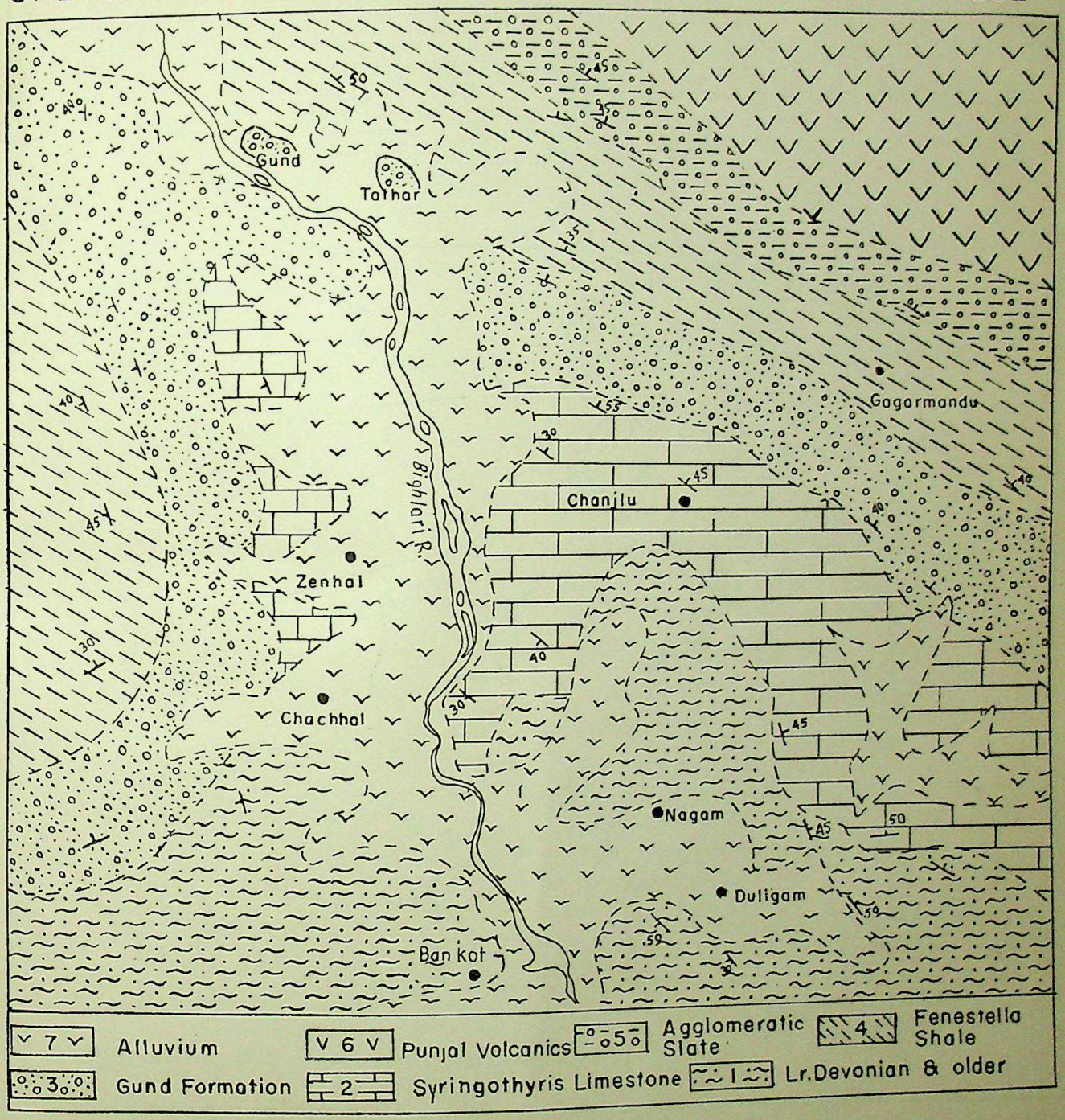

Fig - 1

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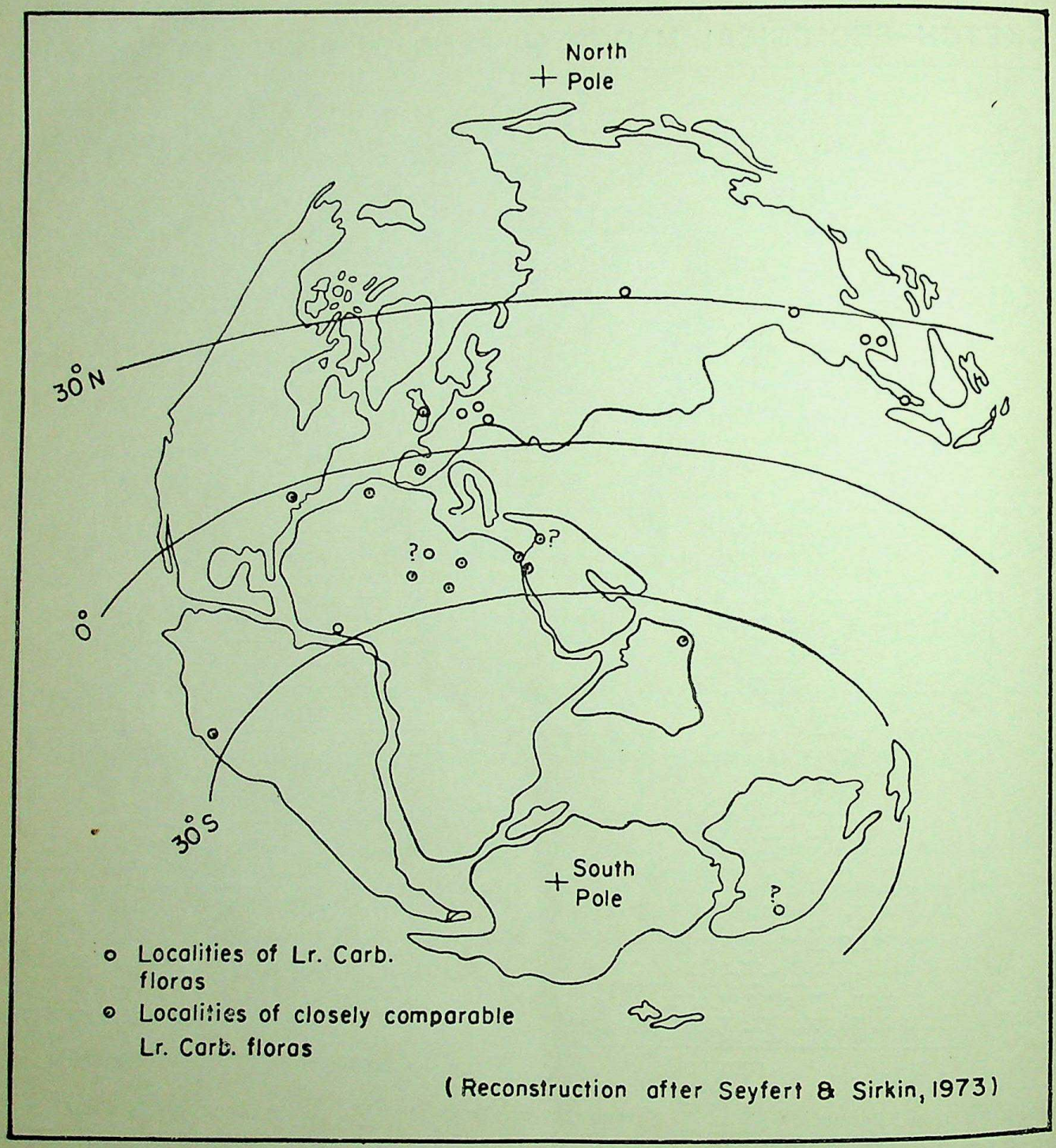

Fig - 2

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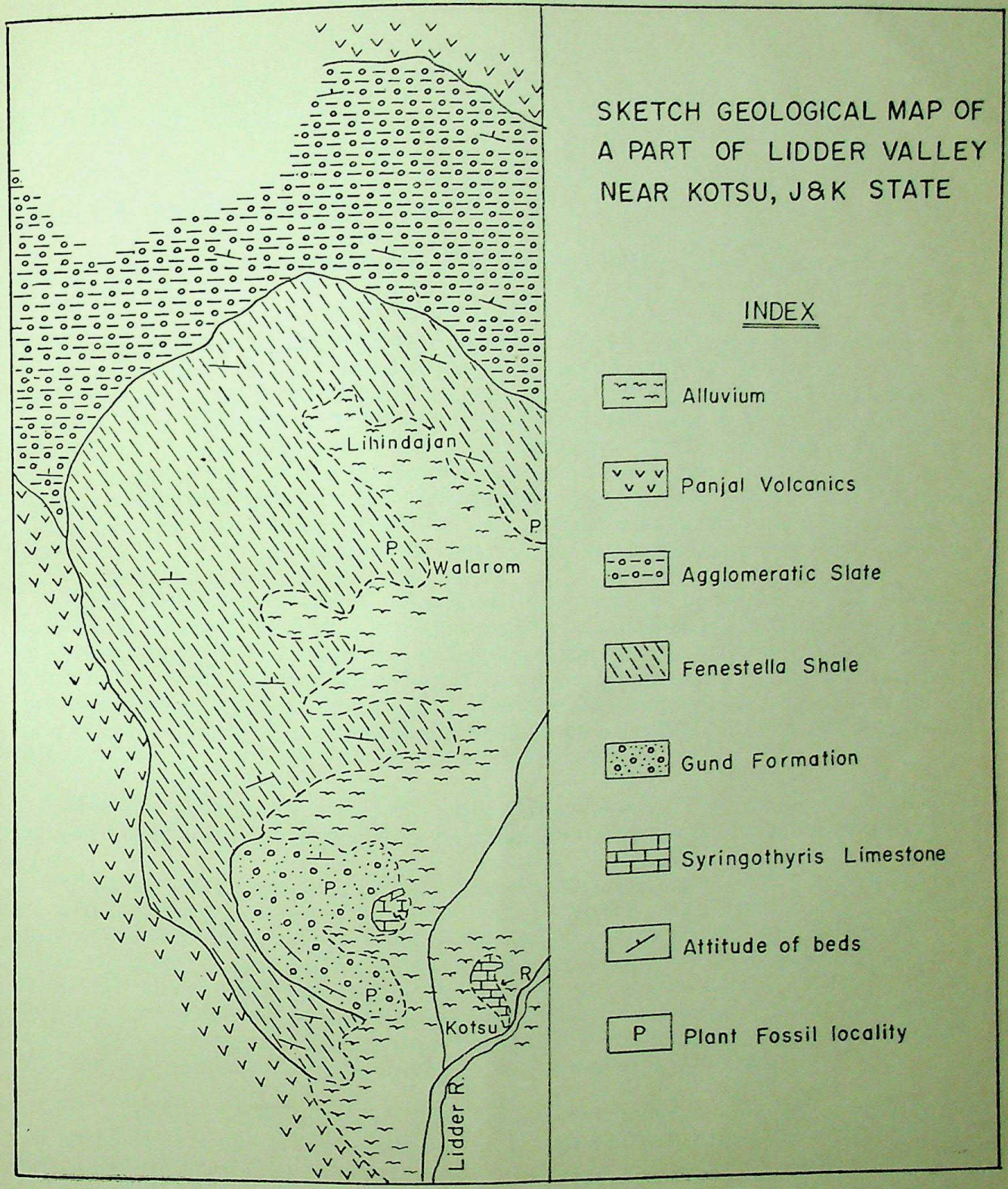

Fig - 3

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BOOK REVIEW

HOW TO SEE A PAINTING

(Being a review of the *Chitradarśan(a)* by Aloke Mukhopadhyay, Calcutta, 1394 B.S., Rs. 120/-).

PAINTING is among the earliest expressions of man's creative art. Beginning from a primitive base various countries have developed different techniques, styles and aesthetics pertaining to painting. The grammar of sophisticated and also folk painting may vary from country to country and sometimes from area to area. Yet paintings of all ages and territories have certain common elements,—the support (wall, panel, canvas, paper, etc.), the paint, the act of painting and the actor or the artist, who himself works against a particular socio-economic background and often paints with certain objectives. His product attains lasting acceptability and even universality when appreciated by viewers. The artist, the art product and the viewers constitute the world of painting.

Thus the viewers is no less important than the art or its producer. It is he whose judgement makes or mar an artist. However, to be a viewer or a critic in the real sense of the term one has to know the principles of painting and the art of examining it. Unfortunately the viewers' grammar is not properly formulated in Bengali language. But this is a desideratum if we wish to offer popular patronage to a medium of expression of man's genius. This need is now fulfilled by a remarkable book from the pen of Aloke Mukherjee, already well-known as an art historian.

The monograph, appropriately called *Chitradarśan(a)* ("The viewing of Painting"), teaches the grammar of appreciating painting. It is conveniently divided into three parts.

The first part discusses the composing elements of painting like the support or base of painting, composition (natural as well as abstract), line, form, stance, perspective (perceptual and conceptual), colour, tone and medium of painting. In dealing with these topics the author has depended more on the features learnt from actual specimens from different countries (including India) than on the formal treatises on art written in early or mediaeval ages. Selecting appropriate illustrations from a vast array of mediaeval and modern paintings from European countries, India, China, etc., he lucidly explains the points to be remembered in understanding a painting.

The artist's socio-economic and cultural background and his objectives are discussed in part two of the monograph. The value of this section can hardly be overestimated. An artist does not live or create in void; he is a creature of certain conditions, which are bound to influence his thought and action. Those conditions will then have to be learnt first if one aspires to examine his works.

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How such an exercise can be effected is taught in the third part of the monograph, when the backgrounds of the activities of some great western painters and there works are dealt with. Unfortunately no Indian artist has joined the select band. No doubt, early and mediaeval Indian art is largely anonymous. But surely some Indian greats of modern times could have easily been included in the list of consideration.

This deficiency, however, does not minimise the basic value of this monograph. This is undoubtedly the best guide book in Bengali to a learner or lover of painting. It also contains much food for thought for even seasoned artists and art critics. The printing and get-up are also of a fairly high standard. The book is indeed a significant contribution to the non-too-rich technical literature in Bengali.

This monograph is a must for libraries and Bengali-speaking artists, and students and lovers of art.

B. N. Mukherjee

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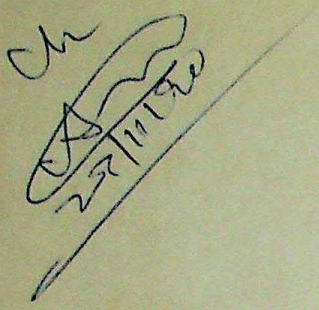

Anish Book Binder

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